



07/08/13

Technical Report for

Aquaterra Technologies, Inc.

Sun-Marcus Hook Refinery, Philadelphia, PA

AOI-5

Accutest Job Number: JB39439

Sampling Date: 06/12/13

Report to:

**AquaTerra Technologies
122 South Church Street P.O. Box 744
West Chester, PA 19382
jennifer.menges@stantec.com; kward@langan.com;
ptroy@langan.com; estrake@langan.com;
ATTN: Tiffani Doerr**

Total number of pages in report: 225



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

**Nancy Cole
Laboratory Director**

Client Service contact: Kristin Beebe 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), PA, RI, SC, TN, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Aquaterra Technologies, Inc.

Job No: JB39439

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JB39439-1	06/12/13	08:00 LM	06/12/13	SO	Soil	AOI-5_MW-464_0-2'_61213
JB39439-2	06/12/13	09:00 LM	06/12/13	SO	Soil	AOI-5_MW-464_2-4'_61213
JB39439-3	06/12/13	10:00 LM	06/12/13	SO	Soil	AOI5_MW-467_0-1_061213
JB39439-4	06/12/13	11:00 LM	06/12/13	SO	Soil	AOI5_MW-467_9-10_061213

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Aquaterra Technologies, Inc.

Job No JB39439

Site: Sun-Marcus Hook Refinery, Philadelphia, PA

Report Date 7/8/2013 10:17:52 AM

On 06/12/2013, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 3 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JB39439 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatile by GCMS By Method SW846 8260B

Matrix: SO

Batch ID: VD8577

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB38864-1MS, JB38864-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- JB39439-4: Dilution required due to matrix interference.

Matrix: SO

Batch ID: VI7479

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB39605-4MS, JB39605-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix: SO

Batch ID: VI7481

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB39553-1MS, JB39553-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C

Matrix: SO

Batch ID: M:OP33636

- The data for SW846 8270C meets quality control requirements.
- JB39439-1: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-4: Analysis performed at Accutest Laboratories, Marlborough, MA.

Volatile by GC By Method SW846 8011

Matrix: SO

Batch ID: M:OP33671

- The data for SW846 8011 meets quality control requirements.
- JB39439-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-1: Analysis performed at Accutest Laboratories, Marlborough, MA.

Metals By Method SW846 6010C

Matrix: SO

Batch ID: M:MP21183

- The data for SW846 6010C meets quality control requirements.
- JB39439-4 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-1 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-2 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-3 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO

Batch ID: M:GN43287

- The data for SM21 2540 B MOD. meets quality control requirements.
- JB39439-1 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-2 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-3 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39439-4 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest New Jersey

Job No JB39439

Site: AQTAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Report Date 7/8/2013 1:54:30 PM

4 Sample(s) were collected on 06/12/2013 and were received at Accutest of NJ on 06/12/2013, at Accutest of NE on 06/14/2013 properly preserved, at 1.4 Deg. C and intact. These Samples received an Accutest job number of JB39439. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Extractables by GCMS By Method SW846 8270C

Matrix: SO	Batch ID: OP33636
-------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB39339-1MS, JB39339-1MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8011

Matrix: SO	Batch ID: OP33671
-------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB39439-1MS, JB39439-1MSD were used as the QC samples indicated.
- JB39439-3, 4, OP33671-MS/MSD for Bromofluorobenzene (S): Outside control limits due to possible matrix interference.

Metals By Method SW846 6010C

Matrix: SO	Batch ID: MP21183
-------------------	--------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC21539-9SDL, MC21539-9MSD were used as the QC samples for metals.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO	Batch ID: GN43287
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- Sample(s) JB39439-1DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(JB39439).

Summary of Hits

Page 1 of 1

Job Number: JB39439

Account: Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Collected: 06/12/13

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Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JB39439-1 AOI-5_MW-464_0-2'_61213						
Lead ^a	18.5	0.87	0.15	mg/kg	SW846 6010C	
JB39439-2 AOI-5_MW-464_2-4'_61213						
Methyl Tert Butyl Ether	0.00060 J	0.00098	0.00023	mg/kg	SW846 8260B	
Lead ^a	13.2	0.89	0.15	mg/kg	SW846 6010C	
JB39439-3 AOI5_MW-467_0-1_061213						
Anthracene ^a	0.129	0.11	0.014	mg/kg	SW846 8270C	
Benzo(a)anthracene ^a	0.335	0.11	0.015	mg/kg	SW846 8270C	
Benzo(a)pyrene ^a	0.316	0.11	0.012	mg/kg	SW846 8270C	
Benzo(b)fluoranthene ^a	0.292	0.11	0.014	mg/kg	SW846 8270C	
Benzo(g,h,i)perylene ^a	0.231	0.11	0.011	mg/kg	SW846 8270C	
Chrysene ^a	0.340	0.11	0.014	mg/kg	SW846 8270C	
Fluorene ^a	0.0182 J	0.11	0.015	mg/kg	SW846 8270C	
Phenanthrene ^a	0.450	0.11	0.015	mg/kg	SW846 8270C	
Pyrene ^a	0.623	0.11	0.013	mg/kg	SW846 8270C	
Lead ^a	33.9	0.84	0.14	mg/kg	SW846 6010C	
JB39439-4 AOI5_MW-467_9-10_061213						
Ethylbenzene ^b	0.141	0.12	0.030	mg/kg	SW846 8260B	
Isopropylbenzene ^b	0.390 J	0.58	0.0085	mg/kg	SW846 8260B	
1,2,4-Trimethylbenzene ^b	0.227 J	0.58	0.024	mg/kg	SW846 8260B	
1,3,5-Trimethylbenzene ^b	0.198 J	0.58	0.018	mg/kg	SW846 8260B	
Naphthalene ^a	2.41	0.13	0.021	mg/kg	SW846 8270C	
Phenanthrene ^a	0.0213 J	0.13	0.018	mg/kg	SW846 8270C	
Lead ^a	6.3	0.81	0.14	mg/kg	SW846 6010C	

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Dilution required due to matrix interference.



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Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

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Client Sample ID: AOI-5_MW-464_0-2'_61213**Lab Sample ID:** JB39439-1**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8260B**Percent Solids:** 90.0**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I185133.D	1	06/14/13	SJM	n/a	n/a	VI7479
Run #2							

Initial Weight

Run #1 5.8 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00096	0.00011	mg/kg	
108-88-3	Toluene	ND	0.00096	0.00010	mg/kg	
100-41-4	Ethylbenzene	ND	0.00096	0.00025	mg/kg	
1330-20-7	Xylene (total)	ND	0.00096	0.00013	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.00096	0.00023	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00096	0.00013	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0048	0.000071	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0048	0.00020	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0048	0.00015	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		65-131%
17060-07-0	1,2-Dichloroethane-D4	104%		70-121%
2037-26-5	Toluene-D8	103%		80-128%
460-00-4	4-Bromofluorobenzene	102%		67-131%

ND = Not detected

MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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Client Sample ID:	AOI-5_MW-464_0-2'_61213	Date Sampled:	06/12/13
Lab Sample ID:	JB39439-1	Date Received:	06/12/13
Matrix:	SO - Soil	Percent Solids:	90.0
Method:	SW846 8270C SW846 3546		
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	R31578.D	1	06/19/13	AMA	06/17/13	M:OP33636	M:MSR1149
Run #2							

	Initial Weight	Final Volume
Run #1	20.7 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.11	0.013	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.11	0.014	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.11	0.012	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.11	0.013	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.11	0.011	mg/kg	
218-01-9	Chrysene	ND	0.11	0.013	mg/kg	
86-73-7	Fluorene	ND	0.11	0.014	mg/kg	
91-20-3	Naphthalene	ND	0.11	0.017	mg/kg	
85-01-8	Phenanthrene	ND	0.11	0.015	mg/kg	
129-00-0	Pyrene	ND	0.11	0.013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	46%		30-130%
321-60-8	2-Fluorobiphenyl	61%		30-130%
1718-51-0	Terphenyl-d14	83%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-464_0-2'_61213**Lab Sample ID:** JB39439-1**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8011 SW846 3550B**Percent Solids:** 90.0**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB48732.D	1	06/19/13	AMA	06/18/13	M:OP33671	M:GBB2907
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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460-00-4	Bromofluorobenzene (S)	99%		61-167%
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460-00-4	Bromofluorobenzene (S)	140%		61-167%
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(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: AOI-5_MW-464_0-2'_61213
Lab Sample ID: JB39439-1
Matrix: SO - Soil
Date Sampled: 06/12/13
Date Received: 06/12/13
Percent Solids: 90.0
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Lead ^a	18.5	0.87	0.15	mg/kg	1	06/14/13	06/17/13	AMA	SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: M:MA15757

(2) Prep QC Batch: M:MP21183

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
 MDL = Method Detection Limit

U = Indicates a result < MDL
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

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4.2
4**Client Sample ID:** AOI-5_MW-464_2-4'_61213**Lab Sample ID:** JB39439-2**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8260B**Percent Solids:** 80.9**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I185194.D	1	06/17/13	SJM	n/a	n/a	VI7481
Run #2							

Initial WeightRun #1 6.3 g
Run #2**Leaded Gasoline and Aviation Gas List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00098	0.00012	mg/kg	
108-88-3	Toluene	ND	0.00098	0.00010	mg/kg	
100-41-4	Ethylbenzene	ND	0.00098	0.00026	mg/kg	
1330-20-7	Xylene (total)	ND	0.00098	0.00014	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	0.00060	0.00098	0.00023	mg/kg	J
107-06-2	1,2-Dichloroethane	ND	0.00098	0.00013	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0049	0.000073	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0049	0.00021	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0049	0.00016	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		65-131%
17060-07-0	1,2-Dichloroethane-D4	104%		70-121%
2037-26-5	Toluene-D8	102%		80-128%
460-00-4	4-Bromofluorobenzene	103%		67-131%

ND = Not detected

MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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4.2

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Client Sample ID:	AOI-5_MW-464_2-4'_61213	Date Sampled:	06/12/13
Lab Sample ID:	JB39439-2	Date Received:	06/12/13
Matrix:	SO - Soil	Percent Solids:	80.9
Method:	SW846 8270C SW846 3546		
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	R31579.D	1	06/19/13	AMA	06/17/13	M:OP33636	M:MSR1149
Run #2							

	Initial Weight	Final Volume
Run #1	20.3 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.12	0.015	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.12	0.016	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.12	0.013	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.12	0.015	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.12	0.012	mg/kg	
218-01-9	Chrysene	ND	0.12	0.015	mg/kg	
86-73-7	Fluorene	ND	0.12	0.016	mg/kg	
91-20-3	Naphthalene	ND	0.12	0.020	mg/kg	
85-01-8	Phenanthrene	ND	0.12	0.016	mg/kg	
129-00-0	Pyrene	ND	0.12	0.014	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	67%		30-130%
321-60-8	2-Fluorobiphenyl	79%		30-130%
1718-51-0	Terphenyl-d14	91%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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4.2

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Client Sample ID: AOI-5_MW-464_2-4'_61213**Lab Sample ID:** JB39439-2**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8011 SW846 3550B**Percent Solids:** 80.9**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB48733.D	1	06/19/13	AMA	06/18/13	M:OP33671	M:GBB2907
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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460-00-4	Bromofluorobenzene (S)	116%		61-167%
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460-00-4	Bromofluorobenzene (S)	164%		61-167%
----------	------------------------	------	--	---------

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	AOI-5_MW-464_2-4'_61213	Date Sampled:	06/12/13
Lab Sample ID:	JB39439-2	Date Received:	06/12/13
Matrix:	SO - Soil	Percent Solids:	80.9
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead ^a	13.2	0.89	0.15	mg/kg	1	06/14/13	06/17/13	AMA SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: M:MA15757

(2) Prep QC Batch: M:MP21183

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
 MDL = Method Detection Limit

U = Indicates a result < MDL
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.3
4**Client Sample ID:** AOI5_MW-467_0-1_061213**Lab Sample ID:** JB39439-3**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8260B**Percent Solids:** 87.2**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I185135.D	1	06/14/13	SJM	n/a	n/a	VI7479
Run #2							

Initial Weight

Run #1 7.0 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00082	0.000097	mg/kg	
108-88-3	Toluene	ND	0.00082	0.000086	mg/kg	
100-41-4	Ethylbenzene	ND	0.00082	0.00022	mg/kg	
1330-20-7	Xylene (total)	ND	0.00082	0.00011	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.00082	0.00019	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00082	0.00011	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0041	0.000061	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0041	0.00017	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0041	0.00013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		65-131%
17060-07-0	1,2-Dichloroethane-D4	103%		70-121%
2037-26-5	Toluene-D8	103%		80-128%
460-00-4	4-Bromofluorobenzene	102%		67-131%

ND = Not detected

MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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4.3
4

Client Sample ID:	AOI5_MW-467_0-1_061213	Date Sampled:	06/12/13
Lab Sample ID:	JB39439-3	Date Received:	06/12/13
Matrix:	SO - Soil	Percent Solids:	87.2
Method:	SW846 8270C SW846 3546		
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	R31580.D	1	06/19/13	AMA	06/17/13	M:OP33636	M:MSR1149
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	0.129	0.11	0.014	mg/kg	
56-55-3	Benzo(a)anthracene	0.335	0.11	0.015	mg/kg	
50-32-8	Benzo(a)pyrene	0.316	0.11	0.012	mg/kg	
205-99-2	Benzo(b)fluoranthene	0.292	0.11	0.014	mg/kg	
191-24-2	Benzo(g,h,i)perylene	0.231	0.11	0.011	mg/kg	
218-01-9	Chrysene	0.340	0.11	0.014	mg/kg	
86-73-7	Fluorene	0.0182	0.11	0.015	mg/kg	J
91-20-3	Naphthalene	ND	0.11	0.018	mg/kg	
85-01-8	Phenanthrene	0.450	0.11	0.015	mg/kg	
129-00-0	Pyrene	0.623	0.11	0.013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	61%		30-130%
321-60-8	2-Fluorobiphenyl	76%		30-130%
1718-51-0	Terphenyl-d14	87%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.3
4**Client Sample ID:** AOI5_MW-467_0-1_061213**Lab Sample ID:** JB39439-3**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8011 SW846 3550B**Percent Solids:** 87.2**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB48734.D	1	06/19/13	AMA	06/18/13	M:OP33671	M:GBB2907
Run #2							

	Initial Weight	Final Volume
Run #1	31.0 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
----------------	-----------------------------	---------------	---------------	---------------

460-00-4	Bromofluorobenzene (S)	107%		61-167%
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460-00-4	Bromofluorobenzene (S)	176% ^b		61-167%
----------	------------------------	-------------------	--	---------

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Outside control limits due to possible matrix interference.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: AOI5_MW-467_0-1_061213
Lab Sample ID: JB39439-3
Matrix: SO - Soil
Date Sampled: 06/12/13
Date Received: 06/12/13
Percent Solids: 87.2
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead ^a	33.9	0.84	0.14	mg/kg	1	06/14/13	06/17/13	AMA SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: M:MA15757

(2) Prep QC Batch: M:MP21183

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
 MDL = Method Detection Limit

U = Indicates a result < MDL
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI5_MW-467_9-10_061213**Lab Sample ID:** JB39439-4**Date Sampled:** 06/12/13**Matrix:** SO - Soil**Date Received:** 06/12/13**Method:** SW846 8260B**Percent Solids:** 76.2**Project:** Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	D210122.D	1	06/17/13	ET	n/a	n/a	VD8577
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.6 g	10.0 ml	100 ul
Run #2			

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.12	0.014	mg/kg	
108-88-3	Toluene	ND	0.12	0.012	mg/kg	
100-41-4	Ethylbenzene	0.141	0.12	0.030	mg/kg	
1330-20-7	Xylene (total)	ND	0.12	0.016	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.12	0.027	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.12	0.016	mg/kg	
98-82-8	Isopropylbenzene	0.390	0.58	0.0085	mg/kg	J
95-63-6	1,2,4-Trimethylbenzene	0.227	0.58	0.024	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.198	0.58	0.018	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		65-131%
17060-07-0	1,2-Dichloroethane-D4	108%		70-121%
2037-26-5	Toluene-D8	112%		80-128%
460-00-4	4-Bromofluorobenzene	103%		67-131%

(a) Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID:	AOI5_MW-467_9-10_061213	Date Sampled:	06/12/13
Lab Sample ID:	JB39439-4	Date Received:	06/12/13
Matrix:	SO - Soil	Percent Solids:	76.2
Method:	SW846 8270C SW846 3546		
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	R31581.D	1	06/19/13	AMA	06/17/13	M:OP33636	M:MSR1149
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.13	0.016	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.13	0.017	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.13	0.014	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.13	0.016	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.13	0.013	mg/kg	
218-01-9	Chrysene	ND	0.13	0.016	mg/kg	
86-73-7	Fluorene	ND	0.13	0.017	mg/kg	
91-20-3	Naphthalene	2.41	0.13	0.021	mg/kg	
85-01-8	Phenanthrene	0.0213	0.13	0.018	mg/kg	J
129-00-0	Pyrene	ND	0.13	0.015	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	65%		30-130%
321-60-8	2-Fluorobiphenyl	76%		30-130%
1718-51-0	Terphenyl-d14	79%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID:	AOI5_MW-467_9-10_061213	Date Sampled:	06/12/13
Lab Sample ID:	JB39439-4	Date Received:	06/12/13
Matrix:	SO - Soil	Percent Solids:	76.2
Method:	SW846 8011 SW846 3550B		
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BB48735.D	1	06/19/13	AMA	06/18/13	M:OP33671	M:GBB2907
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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106-93-4	1,2-Dibromoethane	ND	0.0033	0.0013	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
----------------	-----------------------------	---------------	---------------	---------------

460-00-4	Bromofluorobenzene (S)	197% ^b		61-167%
460-00-4	Bromofluorobenzene (S)	156%		61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Outside control limits due to possible matrix interference.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: AOI5_MW-467_9-10_061213
Lab Sample ID: JB39439-4
Matrix: SO - Soil
Date Sampled: 06/12/13
Date Received: 06/12/13
Percent Solids: 76.2
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead ^a	6.3	0.81	0.14	mg/kg	1	06/14/13	06/17/13	AMA SW846 6010C ¹	SW846 3050B ²

- (1) Instrument QC Batch: M:MA15757
(2) Prep QC Batch: M:MP21183

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL



Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

CHAIN OF CUSTODY
 2235 Route 130, Dayton, NJ 08810
 Tel: 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

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Client / Reporting Information		Project Information												
Company Name: AQUATERRA TECHNOLOGIES Street Address: 122 S. Church Street West Chester, PA 19382		Project Name: MARCUS HOOK REFINERY ADI-5 Street: City: State: Zip: Billing Information (if different from Report to) Company Name:												
Project Contact: Telephone: 702 E-mail:		Project # Street Address												
Phone #: Fax #: Sampler(s) Name(s): Luke Makayki & Eric Dieck		Client Purchase Order #: City: State: Zip: Project Manager: Attention:												
Accutest Sample #	Field ID / Point of Collection	Collection					Number of preserved Bottles					LAB USE ONLY		
		MEOH/Divial #	Date	Time	Sampled by	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE		D/Water	MEOH
1	ADI-S-MW-Y6Y-0-2_61213	4676 61213	6-12-13	0800	LM	SD	5			2	1			SEE ATTACHED
2	ADI-S-MW-Y6Y-2_4_61213	4676 61213	6-12-13	0900	LM	SD	5			2	1			FOR LIST OF ANALYSES
	ADI-S-MW-Y6Y-4_61213	4676 61213	6-12-13	1000	ED	SD	5			3	1			
	ADI-S-MW-Y6Y-9-10-06013	4676 6511	6-12-13	1100	ED	SD	5			4	1			
Turnaround Time (Business days)		Data Deliverable Information										Comments / Special Instructions		
<input type="checkbox"/> Std. 15 Business Days <input checked="" type="checkbox"/> Std. 10 Business Days (by Contract only) <input type="checkbox"/> 10 Day RUSH <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA LabLink		Approved By (Accutest PM): Date: _____										<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> NYASP Category A <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category B <input type="checkbox"/> FULL1 (Level 3+4) <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> NJ Reduced <input type="checkbox"/> EDD Format <input type="checkbox"/> Commercial "C" <input type="checkbox"/> Other Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		
Rec'd at External Service Center Date: 6-12-13 Initials: MA														
Sample Custody must be documented below each time samples change possession, including courier delivery. Relinquished by Sampler: 1 Received By: 1 Relinquished By: 2 Date Time: 6-12-13 1500 Received By: 2 Date Time: 6-12-13 1600 Relinquished by Sampler: 3 Received By: 3 Relinquished By: 4 Date Time: 6-12-13 1700 Received By: 4 Date Time: 6-12-13 1800 Relinquished by: 5 Received By: 5 Custody Seal # Intact Preserved where applicable On Ice Cooler Temp: 3.0														

JB39439: Chain of Custody

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JB39439

Constituents of Concern for Soil
Sunoco Philadelphia Refinery
Philadelphia, Pennsylvania

METALS		CAS No.	Method
Lead (total)		7439-92-1	SW846 6010B/C-LD
VOLATILE ORGANIC COMPOUNDS			
1,2-Dichloroethane		107-06-2	
1,2,4-Trimethylbenzene		95-63-6	
1,3,5-Trimethylbenzene		108-67-8	
Benzene		71-43-2	SW846 8260B/C-LD
Cumene		98-82-8	
Ethylbenzene		100-41-4	
Methyl tertiary butyl ether		1634-04-4	
Toluene		108-88-3	
Xylenes (total)		1330-20-7	
Ethylenedibromide		106-93-4	SW846 8011-LD
SEMI-VOLATILE ORGANIC COMPOUNDS			
Anthracene		120-12-7	
Benzol[a]anthracene		56-55-3	
Benzol[g,h,i]perylene		191-24-2	
Benzol[a]pyrene		50-32-8	
Benzol[b]fluoranthene		205-99-2	SW846 8270C/D-LD
Chrysene		218-01-9	
Fluorene		86-73-7	
Naphthalene *		91-20-3	
Phenanthrene		85-01-8	
Pyrene		129-00-0	

Notes:

As indicated by the "LD", all samples are to be analyzed using the lowest dilution possible.

* For tank investigations, Naphthalene is to be run using analytical method SW846 6280 and should be appropriately marked on the chain of custody.

JB39439: Chain of Custody

Page 2 of 3



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB39439

Client: _____

Project: _____

Date / Time Received: 6/12/2013

Delivery Method: _____

Airbill #'s: _____

Cooler Temps (Initial/Adjusted): #1: (3/3); 0

Cooler Security **Y or N**

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature **Y or N**

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun _____ | |
| 3. Cooler media: | Ice (Bag) _____ | |
| 4. No. Coolers: | 1 | |

Quality Control_Preservatio **Y or N** **N/A**

- | | | | |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Sample Integrity - Documentation

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample rcvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | | |

Y or N**Y or N**

Intact

Sample Integrity - Instructions

- | | | |
|---|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sufficient volume rcvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Y or N N/A

Comments

Accutest Laboratories
V:732.329.02002235 US Highway 130
F: 732.329.3499Dayton, New Jersey
www.accutest.com

JB39439: Chain of Custody
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Accutest Laboratories

Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

Job No: JB39439

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JB39439-1	Collected: 12-JUN-13 08:00 By: LM		Received: 12-JUN-13 By: AS			
AOI-5_MW-464_0-2'_61213						
JB39439-1	SW846 8260B	14-JUN-13 17:15	SJM			V8260SL
JB39439-1	SM21 2540 B MOD.	17-JUN-13	AMA			%SOL
JB39439-1	SW846 6010C	17-JUN-13 18:20	AMA	14-JUN-13	AMA	PB
JB39439-1	SW846 8011	19-JUN-13 16:24	AMA	18-JUN-13	AMA	V8011EDB
JB39439-1	SW846 8270C	19-JUN-13 20:09	AMA	17-JUN-13	AMA	B8270SL
JB39439-2	Collected: 12-JUN-13 09:00 By: LM		Received: 12-JUN-13 By: AS			
AOI-5_MW-464_2-4'_61213						
JB39439-2	SM21 2540 B MOD.	17-JUN-13	AMA			%SOL
JB39439-2	SW846 6010C	17-JUN-13 18:24	AMA	14-JUN-13	AMA	PB
JB39439-2	SW846 8260B	17-JUN-13 18:52	SJM			V8260SL
JB39439-2	SW846 8011	19-JUN-13 16:51	AMA	18-JUN-13	AMA	V8011EDB
JB39439-2	SW846 8270C	19-JUN-13 20:32	AMA	17-JUN-13	AMA	B8270SL
JB39439-3	Collected: 12-JUN-13 10:00 By: LM		Received: 12-JUN-13 By: AS			
AOI5_MW-467_0-1_061213						
JB39439-3	SW846 8260B	14-JUN-13 18:13	SJM			V8260SL
JB39439-3	SM21 2540 B MOD.	17-JUN-13	AMA			%SOL
JB39439-3	SW846 6010C	17-JUN-13 18:28	AMA	14-JUN-13	AMA	PB
JB39439-3	SW846 8011	19-JUN-13 17:18	AMA	18-JUN-13	AMA	V8011EDB
JB39439-3	SW846 8270C	19-JUN-13 20:56	AMA	17-JUN-13	AMA	B8270SL
JB39439-4	Collected: 12-JUN-13 11:00 By: LM		Received: 12-JUN-13 By: AS			
AOI5_MW-467_9-10_061213						
JB39439-4	SM21 2540 B MOD.	17-JUN-13	AMA			%SOL
JB39439-4	SW846 6010C	17-JUN-13 18:33	AMA	14-JUN-13	AMA	PB
JB39439-4	SW846 8260B	17-JUN-13 21:23	ET			V8260SL
JB39439-4	SW846 8011	19-JUN-13 17:47	AMA	18-JUN-13	AMA	V8011EDB
JB39439-4	SW846 8270C	19-JUN-13 21:19	AMA	17-JUN-13	AMA	B8270SL

Accutest Internal Chain of Custody

Page 1 of 2

Job Number: JB39439
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 06/12/13

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB39439-1.1	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-1.1	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-1.2	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-1.2	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-1.4	Secured Storage	Scott McGonigal	06/14/13 11:55	Retrieve from Storage
JB39439-1.4	Scott McGonigal	GCMSI	06/14/13 11:55	Load on Instrument
JB39439-1.4	GCMSI	Scott McGonigal	06/17/13 11:14	Unload from Instrument
JB39439-1.4	Scott McGonigal		06/17/13 11:14	Depleted
JB39439-2.1	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-2.1	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-2.2	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-2.2	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-2.4	Secured Storage	Scott McGonigal	06/14/13 11:55	Retrieve from Storage
JB39439-2.4	Scott McGonigal	GCMSI	06/14/13 11:55	Load on Instrument
JB39439-2.4	GCMSI	Scott McGonigal	06/17/13 11:14	Unload from Instrument
JB39439-2.4	Scott McGonigal		06/17/13 11:14	Depleted
JB39439-2.5	Secured Storage	Scott McGonigal	06/17/13 11:15	Retrieve from Storage
JB39439-2.5	Scott McGonigal	GCMSI	06/17/13 11:15	Load on Instrument
JB39439-2.5	GCMSI	Scott McGonigal	06/19/13 11:42	Unload from Instrument
JB39439-2.5	Scott McGonigal		06/19/13 11:43	Depleted
JB39439-3.1	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-3.1	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-3.2	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-3.2	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-3.4	Secured Storage	Scott McGonigal	06/14/13 11:55	Retrieve from Storage
JB39439-3.4	Scott McGonigal	GCMSI	06/14/13 11:55	Load on Instrument
JB39439-3.4	GCMSI	Scott McGonigal	06/17/13 11:14	Unload from Instrument
JB39439-3.4	Scott McGonigal		06/17/13 11:14	Depleted
JB39439-4.1	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-4.1	Robert Lofrano		06/13/13 14:05	Subcontract
JB39439-4.2	Secured Storage	Robert Lofrano	06/13/13 14:05	Retrieve from Storage
JB39439-4.2	Robert Lofrano		06/13/13 14:05	Subcontract

Accutest Internal Chain of Custody

Page 2 of 2

Job Number: JB39439
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 06/12/13

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB39439-4.3	Secured Storage	Emily Tran	06/14/13 16:37	Retrieve from Storage
JB39439-4.3	Emily Tran	Secured Storage	06/14/13 16:37	Return to Storage
JB39439-4.4	Secured Storage	Scott McGonigal	06/14/13 11:55	Retrieve from Storage
JB39439-4.4	Scott McGonigal	GCMSI	06/14/13 11:55	Load on Instrument
JB39439-4.4	GCMSI	Scott McGonigal	06/14/13 16:03	Unload from Instrument
JB39439-4.4	Scott McGonigal	Secured Storage	06/17/13 10:18	Return to Storage



GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries



Method Blank Summary

Job Number: JB39439

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI7479-MB1	I185124.D	1	06/14/13	SJM	n/a	n/a	VI7479

The QC reported here applies to the following samples:**Method: SW846 8260B**

JB39439-1, JB39439-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.12	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.26	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.074	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/kg	
108-88-3	Toluene	ND	1.0	0.11	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.16	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.14	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	100% 65-131%
17060-07-0	1,2-Dichloroethane-D4	96% 70-121%
2037-26-5	Toluene-D8	103% 80-128%
460-00-4	4-Bromofluorobenzene	103% 67-131%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

Method Blank Summary

Job Number: JB39439

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI7481-MB1	I185180.D	1	06/17/13	SJM	n/a	n/a	VI7481

The QC reported here applies to the following samples:

Method: SW846 8260B

JB39439-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.12	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.26	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.074	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/kg	
108-88-3	Toluene	ND	1.0	0.11	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.16	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.14	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	94% 65-131%
17060-07-0	1,2-Dichloroethane-D4	86% 70-121%
2037-26-5	Toluene-D8	103% 80-128%
460-00-4	4-Bromofluorobenzene	100% 67-131%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

Method Blank Summary

Job Number: JB39439

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VD8577-MB	D210105.D	1	06/17/13	ET	n/a	n/a	VD8577

The QC reported here applies to the following samples:**Method: SW846 8260B**

JB39439-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	6.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	50	6.8	ug/kg	
100-41-4	Ethylbenzene	ND	50	13	ug/kg	
98-82-8	Isopropylbenzene	ND	250	3.7	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	50	12	ug/kg	
108-88-3	Toluene	ND	50	5.3	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	10	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	8.0	ug/kg	
1330-20-7	Xylene (total)	ND	50	7.0	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	102%
17060-07-0	1,2-Dichloroethane-D4	109%
2037-26-5	Toluene-D8	106%
460-00-4	4-Bromofluorobenzene	104%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

Blank Spike Summary

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI7479-BS	I185125.D	1	06/14/13	SJM	n/a	n/a	VI7479

The QC reported here applies to the following samples:**Method:** SW846 8260B

JB39439-1, JB39439-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	55.7	111	79-121
107-06-2	1,2-Dichloroethane	50	52.9	106	73-132
100-41-4	Ethylbenzene	50	56.4	113	78-119
98-82-8	Isopropylbenzene	50	55.9	112	75-122
1634-04-4	Methyl Tert Butyl Ether	100	100	100	73-122
108-88-3	Toluene	50	53.1	106	78-121
95-63-6	1,2,4-Trimethylbenzene	50	53.9	108	76-121
108-67-8	1,3,5-Trimethylbenzene	50	54.5	109	74-121
1330-20-7	Xylene (total)	150	169	113	79-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	65-131%
17060-07-0	1,2-Dichloroethane-D4	91%	70-121%
2037-26-5	Toluene-D8	104%	80-128%
460-00-4	4-Bromofluorobenzene	97%	67-131%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI7481-BS	I185181.D	1	06/17/13	SJM	n/a	n/a	VI7481

The QC reported here applies to the following samples:**Method:** SW846 8260B

JB39439-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	55.2	110	79-121
107-06-2	1,2-Dichloroethane	50	53.3	107	73-132
100-41-4	Ethylbenzene	50	54.0	108	78-119
98-82-8	Isopropylbenzene	50	53.4	107	75-122
1634-04-4	Methyl Tert Butyl Ether	100	102	102	73-122
108-88-3	Toluene	50	50.7	101	78-121
95-63-6	1,2,4-Trimethylbenzene	50	52.0	104	76-121
108-67-8	1,3,5-Trimethylbenzene	50	52.5	105	74-121
1330-20-7	Xylene (total)	150	164	109	79-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	65-131%
17060-07-0	1,2-Dichloroethane-D4	93%	70-121%
2037-26-5	Toluene-D8	102%	80-128%
460-00-4	4-Bromofluorobenzene	96%	67-131%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VD8577-BS	D210106.D	1	06/17/13	ET	n/a	n/a	VD8577

The QC reported here applies to the following samples:

Method: SW846 8260B

JB39439-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	2500	2410	96	79-121
107-06-2	1,2-Dichloroethane	2500	2770	111	73-132
100-41-4	Ethylbenzene	2500	2490	100	78-119
98-82-8	Isopropylbenzene	2500	2430	97	75-122
1634-04-4	Methyl Tert Butyl Ether	5000	4700	94	73-122
108-88-3	Toluene	2500	2510	100	78-121
95-63-6	1,2,4-Trimethylbenzene	2500	2400	96	76-121
108-67-8	1,3,5-Trimethylbenzene	2500	2200	88	74-121
1330-20-7	Xylene (total)	7500	7650	102	79-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	65-131%
17060-07-0	1,2-Dichloroethane-D4	111%	70-121%
2037-26-5	Toluene-D8	107%	80-128%
460-00-4	4-Bromofluorobenzene	103%	67-131%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB39605-4MS	I185140.D	1	06/14/13	SJM	n/a	n/a	VI7479
JB39605-4MSD	I185141.D	1	06/14/13	SJM	n/a	n/a	VI7479
JB39605-4	I185132.D	1	06/14/13	SJM	n/a	n/a	VI7479

The QC reported here applies to the following samples:

Method: SW846 8260B

JB39439-1, JB39439-3

CAS No.	Compound	JB39605-4		Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q							
71-43-2	Benzene	ND		51.6	30.4	59	34.6	68	13	47-130/22
107-06-2	1,2-Dichloroethane	ND		51.6	32.6	63	35.3	70	8	46-135/21
100-41-4	Ethylbenzene	ND		51.6	24.9	48	27.8	55	11	30-139/25
98-82-8	Isopropylbenzene	ND		51.6	24.2	47	27.0	53	11	30-140/27
1634-04-4	Methyl Tert Butyl Ether	ND		51.6	36.3	70	37.7	74	4	50-127/21
108-88-3	Toluene	ND		51.6	26.1	51	30.3	60	15	38-136/24
95-63-6	1,2,4-Trimethylbenzene	ND		51.6	19.3	37	21.5	42	11	20-145/28
108-67-8	1,3,5-Trimethylbenzene	ND		51.6	21.0	41	22.8	45	8	24-142/28
1330-20-7	Xylene (total)	ND		155	72.3	47	81.3	53	12	31-140/26

CAS No.	Surrogate Recoveries	MS	MSD	JB39605-4	Limits
1868-53-7	Dibromofluoromethane	103%	102%	103%	65-131%
17060-07-0	1,2-Dichloroethane-D4	96%	95%	102%	70-121%
2037-26-5	Toluene-D8	104%	103%	103%	80-128%
460-00-4	4-Bromofluorobenzene	100%	99%	105%	67-131%

* = Outside of Control Limits.

6.3.1
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Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB38864-1MS	D210114.D	1	06/17/13	ET	n/a	n/a	VD8577
JB38864-1MSD	D210115.D	1	06/17/13	ET	n/a	n/a	VD8577
JB38864-1 ^a	D210107.D	1	06/17/13	ET	n/a	n/a	VD8577

The QC reported here applies to the following samples:

Method: SW846 8260B

JB39439-4

CAS No.	Compound	JB38864-1		Spike	MS	MS	MSD	MSD	Limits	
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	%	RPD	Rec/RPD
71-43-2	Benzene	306		11500	12000	102	12400	105	3	47-130/22
107-06-2	1,2-Dichloroethane	ND		11500	12700	111	13200	115	4	46-135/21
100-41-4	Ethylbenzene	272		11500	12400	106	12900	110	4	30-139/25
98-82-8	Isopropylbenzene	ND		11500	12000	104	12400	108	3	30-140/27
1634-04-4	Methyl Tert Butyl Ether	ND		11500	11200	97	11300	98	1	50-127/21
108-88-3	Toluene	2440		11500	14400	104	14800	108	3	38-136/24
95-63-6	1,2,4-Trimethylbenzene	ND		11500	12000	104	12300	107	2	20-145/28
108-67-8	1,3,5-Trimethylbenzene	ND		11500	11200	97	11400	99	2	24-142/28
1330-20-7	Xylene (total)	1670		34500	37800	105	39700	110	5	31-140/26

CAS No.	Surrogate Recoveries	MS	MSD	JB38864-1	Limits
1868-53-7	Dibromofluoromethane	107%	103%	102%	65-131%
17060-07-0	1,2-Dichloroethane-D4	108%	106%	111%	70-121%
2037-26-5	Toluene-D8	109%	109%	110%	80-128%
460-00-4	4-Bromofluorobenzene	105%	103%	107%	67-131%

(a) Diluted due to high concentration of target compound.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB39553-1MS	I185197.D	1	06/17/13	SJM	n/a	n/a	VI7481
JB39553-1MSD	I185198.D	1	06/17/13	SJM	n/a	n/a	VI7481
JB39553-1	I185196.D	1	06/17/13	SJM	n/a	n/a	VI7481

The QC reported here applies to the following samples:

Method: SW846 8260B

JB39439-2

CAS No.	Compound	JB39553-1		Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q							
71-43-2	Benzene	ND	67.7	59.4	88	62.6	93	5	47-130/22	
107-06-2	1,2-Dichloroethane	ND	67.7	66.3	98	67.3	99	1	46-135/21	
100-41-4	Ethylbenzene	ND	67.7	54.5	81	56.8	84	4	30-139/25	
98-82-8	Isopropylbenzene	ND	67.7	51.8	77	54.1	80	4	30-140/27	
1634-04-4	Methyl Tert Butyl Ether	ND	67.7	64.7	96	66.4	98	3	50-127/21	
108-88-3	Toluene	ND	67.7	55.5	82	57.5	85	4	38-136/24	
95-63-6	1,2,4-Trimethylbenzene	ND	67.7	48.6	72	48.6	72	0	20-145/28	
108-67-8	1,3,5-Trimethylbenzene	ND	67.7	49.6	73	50.5	75	2	24-142/28	
1330-20-7	Xylene (total)	ND	203	167	82	173	85	4	31-140/26	

CAS No.	Surrogate Recoveries	MS	MSD	JB39553-1	Limits
1868-53-7	Dibromofluoromethane	99%	101%	102%	65-131%
17060-07-0	1,2-Dichloroethane-D4	96%	98%	99%	70-121%
2037-26-5	Toluene-D8	102%	103%	103%	80-128%
460-00-4	4-Bromofluorobenzene	97%	96%	100%	67-131%

* = Outside of Control Limits.

6.3.3
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Instrument Performance Check (BFB)

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Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VD8524-BFB

Injection Date: 05/14/13

Lab File ID: D208868.D

Injection Time: 17:39

Instrument ID: GCMSD

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	10532	17.7	Pass
75	30.0 - 60.0% of mass 95	28104	47.2	Pass
95	Base peak, 100% relative abundance	59570	100.0	Pass
96	5.0 - 9.0% of mass 95	4008	6.73	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	59178	99.3	Pass
175	5.0 - 9.0% of mass 174	4601	7.72	(7.77) ^a Pass
176	95.0 - 101.0% of mass 174	56389	94.7	(95.3) ^a Pass
177	5.0 - 9.0% of mass 176	3796	6.37	(6.73) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VD8524-IC8524	D208869.D	05/14/13	18:08	00:29	Initial cal 0.5
VD8524-IC8524	D208870.D	05/14/13	18:38	00:59	Initial cal 1
VD8524-IC8524	D208871.D	05/14/13	19:07	01:28	Initial cal 2
VD8524-IC8524	D208872.D	05/14/13	19:36	01:57	Initial cal 5
VD8524-IC8524	D208873.D	05/14/13	20:06	02:27	Initial cal 10
VD8524-IC8524	D208874.D	05/14/13	20:35	02:56	Initial cal 20
VD8524-ICC8524	D208875.D	05/14/13	21:04	03:25	Initial cal 50
VD8524-IC8524	D208876.D	05/14/13	21:33	03:54	Initial cal 100
VD8524-IC8524	D208877.D	05/14/13	22:03	04:24	Initial cal 200
VD8524-ICV8524	D208880.D	05/14/13	23:31	05:52	Initial cal verification 50

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VD8577-BFB	Injection Date:	06/17/13
Lab File ID:	D210102.D	Injection Time:	11:02
Instrument ID:	GCMSD		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	9121	19.7	Pass
75	30.0 - 60.0% of mass 95	25853	55.9	Pass
95	Base peak, 100% relative abundance	46208	100.0	Pass
96	5.0 - 9.0% of mass 95	2851	6.17	Pass
173	Less than 2.0% of mass 174	365	0.79	(0.76) ^a Pass
174	50.0 - 120.0% of mass 95	47965	103.8	Pass
175	5.0 - 9.0% of mass 174	3862	8.36	(8.05) ^a Pass
176	95.0 - 101.0% of mass 174	47762	103.4	(99.6) ^a Pass
177	5.0 - 9.0% of mass 176	3270	7.08	(6.85) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VD8577-CC8524	D210103.D	06/17/13	11:34	00:32	Continuing cal 20
VD8577-MB	D210105.D	06/17/13	12:38	01:36	Method Blank
ZZZZZZ	D210105.D	06/17/13	12:38	01:36	(unrelated sample)
VD8577-BS	D210106.D	06/17/13	13:24	02:22	Blank Spike
JB38864-1	D210107.D	06/17/13	14:01	02:59	(used for QC only; not part of job JB39439)
ZZZZZZ	D210108.D	06/17/13	14:30	03:28	(unrelated sample)
ZZZZZZ	D210109.D	06/17/13	15:00	03:58	(unrelated sample)
ZZZZZZ	D210110.D	06/17/13	15:29	04:27	(unrelated sample)
ZZZZZZ	D210111.D	06/17/13	15:59	04:57	(unrelated sample)
ZZZZZZ	D210112.D	06/17/13	16:28	05:26	(unrelated sample)
ZZZZZZ	D210113.D	06/17/13	16:58	05:56	(unrelated sample)
JB38864-1MS	D210114.D	06/17/13	17:27	06:25	Matrix Spike
JB38864-1MSD	D210115.D	06/17/13	17:57	06:55	Matrix Spike Duplicate
ZZZZZZ	D210116.D	06/17/13	18:26	07:24	(unrelated sample)
ZZZZZZ	D210117.D	06/17/13	18:56	07:54	(unrelated sample)
ZZZZZZ	D210119.D	06/17/13	19:54	08:52	(unrelated sample)
ZZZZZZ	D210120.D	06/17/13	20:24	09:22	(unrelated sample)
ZZZZZZ	D210121.D	06/17/13	20:53	09:51	(unrelated sample)
JB39439-4	D210122.D	06/17/13	21:23	10:21	AOI5_MW-467_9-10_061213

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VI7473-BFB	Injection Date:	06/07/13
Lab File ID:	I184946.D	Injection Time:	14:20
Instrument ID:	GCMSI		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	33517	18.6	Pass
75	30.0 - 60.0% of mass 95	87456	48.6	Pass
95	Base peak, 100% relative abundance	180096	100.0	Pass
96	5.0 - 9.0% of mass 95	12318	6.84	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	172394	95.7	Pass
175	5.0 - 9.0% of mass 174	13801	7.66	(8.01) ^a Pass
176	95.0 - 101.0% of mass 174	166976	92.7	(96.9) ^a Pass
177	5.0 - 9.0% of mass 176	10962	6.09	(6.57) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VI7473-IC7473	I184947.D	06/07/13	15:23	01:03	Initial cal 0.5
VI7473-IC7473	I184948.D	06/07/13	15:57	01:37	Initial cal 1
VI7473-IC7473	I184949.D	06/07/13	16:26	02:06	Initial cal 2
VI7473-IC7473	I184950.D	06/07/13	16:55	02:35	Initial cal 5
VI7473-IC7473	I184951.D	06/07/13	17:24	03:04	Initial cal 10
VI7473-IC7473	I184952.D	06/07/13	17:53	03:33	Initial cal 200
VI7473-IC7473	I184953.D	06/07/13	18:50	04:30	Initial cal 100
VI7473-IC7473	I184954.D	06/07/13	19:48	05:28	Initial cal 50
VI7473-IC7473	I184955.D	06/07/13	20:17	05:57	Initial cal 20
VI7473-ICV7473	I184956.D	06/07/13	20:46	06:26	Initial cal verification 50

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VI7479-BFB	Injection Date:	06/14/13
Lab File ID:	I185120.D	Injection Time:	09:30
Instrument ID:	GCMSI		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	11628	17.5	Pass
75	30.0 - 60.0% of mass 95	32056	48.2	Pass
95	Base peak, 100% relative abundance	66554	100.0	Pass
96	5.0 - 9.0% of mass 95	4557	6.85	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	65576	98.5	Pass
175	5.0 - 9.0% of mass 174	5156	7.75	(7.86) ^a Pass
176	95.0 - 101.0% of mass 174	64154	96.4	(97.8) ^a Pass
177	5.0 - 9.0% of mass 176	4141	6.22	(6.45) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VI7479-CC7473	I185122.D	06/14/13	10:49	01:19	Continuing cal 50
ZZZZZZ	I185124.A.D	06/14/13	11:56	02:26	(unrelated sample)
VI7479-MB1	I185124.D	06/14/13	12:32	03:02	Method Blank
VI7479-BS	I185125.D	06/14/13	13:12	03:42	Blank Spike
ZZZZZZ	I185127.D	06/14/13	14:22	04:52	(unrelated sample)
ZZZZZZ	I185128.D	06/14/13	14:51	05:21	(unrelated sample)
ZZZZZZ	I185129.D	06/14/13	15:20	05:50	(unrelated sample)
ZZZZZZ	I185130.D	06/14/13	15:49	06:19	(unrelated sample)
ZZZZZZ	I185131.D	06/14/13	16:18	06:48	(unrelated sample)
JB39605-4	I185132.D	06/14/13	16:47	07:17	(used for QC only; not part of job JB39439)
JB39439-1	I185133.D	06/14/13	17:15	07:45	AOI-5_MW-464_0-2'_61213
JB39439-3	I185135.D	06/14/13	18:13	08:43	AOI5_MW-467_0-1_061213
ZZZZZZ	I185136.D	06/14/13	18:42	09:12	(unrelated sample)
ZZZZZZ	I185137.D	06/14/13	19:11	09:41	(unrelated sample)
ZZZZZZ	I185139.D	06/14/13	20:09	10:39	(unrelated sample)
JB39605-4MS	I185140.D	06/14/13	20:37	11:07	Matrix Spike
JB39605-4MSD	I185141.D	06/14/13	21:06	11:36	Matrix Spike Duplicate

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VI7481-BFB	Injection Date:	06/17/13
Lab File ID:	I185176.D	Injection Time:	09:11
Instrument ID:	GCMSI		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	14733	17.9	Pass
75	30.0 - 60.0% of mass 95	40248	48.9	Pass
95	Base peak, 100% relative abundance	82274	100.0	Pass
96	5.0 - 9.0% of mass 95	5517	6.71	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	75704	92.0	Pass
175	5.0 - 9.0% of mass 174	6085	7.40	(8.04) ^a Pass
176	95.0 - 101.0% of mass 174	74709	90.8	(98.7) ^a Pass
177	5.0 - 9.0% of mass 176	5169	6.28	(6.92) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VI7481-CC7473	I185178.D	06/17/13	10:41	01:30	Continuing cal 50
VI7481-MB1	I185180.D	06/17/13	11:52	02:41	Method Blank
VI7481-BS	I185181.D	06/17/13	12:26	03:15	Blank Spike
ZZZZZZ	I185183.D	06/17/13	13:30	04:19	(unrelated sample)
ZZZZZZ	I185184.D	06/17/13	13:59	04:48	(unrelated sample)
ZZZZZZ	I185185.D	06/17/13	14:28	05:17	(unrelated sample)
ZZZZZZ	I185186.D	06/17/13	14:57	05:46	(unrelated sample)
ZZZZZZ	I185187.D	06/17/13	15:26	06:15	(unrelated sample)
ZZZZZZ	I185188.D	06/17/13	15:55	06:44	(unrelated sample)
ZZZZZZ	I185189.D	06/17/13	16:25	07:14	(unrelated sample)
ZZZZZZ	I185190.D	06/17/13	16:54	07:43	(unrelated sample)
ZZZZZZ	I185192.D	06/17/13	17:54	08:43	(unrelated sample)
ZZZZZZ	I185193.D	06/17/13	18:23	09:12	(unrelated sample)
JB39439-2	I185194.D	06/17/13	18:52	09:41	AOI-5_MW-464_2-4'_61213
ZZZZZZ	I185195.D	06/17/13	19:21	10:10	(unrelated sample)
JB39553-1	I185196.D	06/17/13	19:50	10:39	(used for QC only; not part of job JB39439)
JB39553-1MS	I185197.D	06/17/13	20:19	11:08	Matrix Spike
JB39553-1MSD	I185198.D	06/17/13	20:48	11:37	Matrix Spike Duplicate

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VD8577-CC8524	Injection Date:	06/17/13
Lab File ID:	D210103.D	Injection Time:	11:34
Instrument ID:	GCMSD	Method:	SW846 8260B

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
Check Std	89117	7.99	186676	10.22	240287	11.13
Upper Limit ^a	178234	8.49	373352	10.72	480574	11.63
Lower Limit ^b	44559	7.49	93338	9.72	120144	10.63

Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
VD8577-MB	61145	8.00	182571	10.22	235802	11.13
ZZZZZZ	61145	8.00	182571	10.22	235802	11.13
VD8577-BS	87611	7.99	184747	10.22	242232	11.13
JB38864-1	72458	7.99	184565	10.21	235869	11.13
ZZZZZZ	85169	7.99	182197	10.22	235374	11.13
ZZZZZZ	75699	7.99	199770	10.22	255362	11.13
ZZZZZZ	85158	7.99	210347	10.22	276390	11.13
ZZZZZZ	101715	7.99	213188	10.22	277064	11.13
ZZZZZZ	98902	8.00	215031	10.22	282062	11.13
ZZZZZZ	103441	8.00	212403	10.22	275609	11.13
JB38864-1MS	94496	7.99	208898	10.22	271950	11.13
JB38864-1MSD	91851	8.00	210085	10.22	273761	11.13
ZZZZZZ	97682	7.98	206449	10.22	271336	11.13
ZZZZZZ	97143	8.00	208102	10.22	272053	11.13
ZZZZZZ	87541	8.01	207170	10.22	272324	11.13
ZZZZZZ	93097	8.00	210979	10.22	278288	11.13
ZZZZZZ	77677	7.99	210112	10.22	273042	11.13
JB39439-4 ^c	74672	8.00	207697	10.22	274263	11.13

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

(c) Dilution required due to matrix interference.

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VI7479-CC7473	Injection Date:	06/14/13
Lab File ID:	I185122.D	Injection Time:	10:49
Instrument ID:	GCMSI	Method:	SW846 8260B

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
Check Std	135224	7.18	371703	9.43	504936	10.35
Upper Limit ^a	270448	7.68	743406	9.93	1009872	10.85
Lower Limit ^b	67612	6.68	185852	8.93	252468	9.85
				400563	216225	15.88
				801126	432450	16.38
				200282	108113	15.38

Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
ZZZZZZ	102194	7.18	340455	9.43	477083	10.35
VI7479-MB1	124339	7.16	347471	9.43	479607	10.35
VI7479-BS	104420	7.18	363774	9.43	506450	10.35
ZZZZZZ	54775*	7.16	329502	9.43	449332	10.36
ZZZZZZ	102601	7.18	331542	9.43	461214	10.36
ZZZZZZ	103899	7.18	332671	9.43	461972	10.35
ZZZZZZ	103980	7.18	341517	9.43	474867	10.36
ZZZZZZ	125800	7.17	329140	9.43	458524	10.35
JB39605-4	119613	7.17	332535	9.43	460964	10.35
JB39439-1	96003	7.18	326400	9.43	457219	10.35
JB39439-3	97041	7.18	325478	9.43	456655	10.36
ZZZZZZ	97501	7.18	333592	9.43	460627	10.36
ZZZZZZ	158233	7.17	357184	9.43	501627	10.35
ZZZZZZ	103369	7.17	345282	9.43	474012	10.35
JB39605-4MS	82065	7.17	339134	9.43	473926	10.35
JB39605-4MSD	85383	7.18	343578	9.43	479555	10.35
				378004	182692	15.88
				378657	182225	15.88
				402043	211192	15.88
				345150	158083	15.88
				366734	174513	15.88
				358151	167304	15.88
				375340	178182	15.88
				357312	171412	15.88
				371687	175055	15.88
				360413	181249	15.88
				366790	174786	15.88
				362972	174646	15.88
				398558	193959	15.88
				370661	181490	15.88
				375996	190695	15.88
				389267	195305	15.88

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VI7481-CC7473	Injection Date:	06/17/13
Lab File ID:	I185178.D	Injection Time:	10:41
Instrument ID:	GCMSI	Method:	SW846 8260B

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
Check Std	120297	7.18	364422	9.43	503461	10.35
Upper Limit ^a	240594	7.68	728844	9.93	1006922	10.85
Lower Limit ^b	60149	6.68	182211	8.93	251731	9.85

Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
VI7481-MB1	67326	7.18	319812	9.43	435592	10.36
VI7481-BS	102813	7.18	335222	9.43	455803	10.35
ZZZZZZ	105509	7.18	307897	9.43	426526	10.35
ZZZZZZ	124300	7.18	330199	9.43	460928	10.35
ZZZZZZ	121091	7.18	327009	9.43	454646	10.36
ZZZZZZ	110574	7.18	321503	9.43	441280	10.36
ZZZZZZ	117891	7.18	314001	9.43	435729	10.36
ZZZZZZ	100040	7.17	309447	9.43	436371	10.36
ZZZZZZ	93958	7.18	299801	9.43	416730	10.36
ZZZZZZ	94401	7.18	305076	9.43	427282	10.36
ZZZZZZ	75339	7.18	310297	9.43	438665	10.35
ZZZZZZ	104746	7.18	317997	9.43	439417	10.36
JB39439-2	128962	7.17	318364	9.43	445058	10.36
ZZZZZZ	75349	7.17	315253	9.43	439627	10.35
JB39553-1	97195	7.20	309664	9.43	432863	10.35
JB39553-1MS	79570	7.19	309748	9.43	425079	10.35
JB39553-1MSD	89184	7.19	320943	9.43	442528	10.35

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JB39439

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8260B

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
JB39439-1	I185133.D	102.0	104.0	103.0	102.0
JB39439-2	I185194.D	104.0	104.0	102.0	103.0
JB39439-3	I185135.D	102.0	103.0	103.0	102.0
JB39439-4	D210122.D	103.0	108.0	112.0	103.0
JB38864-1MS	D210114.D	107.0	108.0	109.0	105.0
JB38864-1MSD	D210115.D	103.0	106.0	109.0	103.0
JB39553-1MS	I185197.D	99.0	96.0	102.0	97.0
JB39553-1MSD	I185198.D	101.0	98.0	103.0	96.0
JB39605-4MS	I185140.D	103.0	96.0	104.0	100.0
JB39605-4MSD	I185141.D	102.0	95.0	103.0	99.0
VD8577-BS	D210106.D	105.0	111.0	107.0	103.0
VD8577-MB	D210105.D	102.0	109.0	106.0	104.0
VI7479-BS	I185125.D	100.0	91.0	104.0	97.0
VI7479-MB1	I185124.D	100.0	96.0	103.0	103.0
VI7481-BS	I185181.D	99.0	93.0	102.0	96.0
VI7481-MB1	I185180.D	94.0	86.0	103.0	100.0

Surrogate
Compounds

Recovery
Limits

S1 = Dibromofluoromethane

65-131%

S2 = 1,2-Dichloroethane-D4

70-121%

S3 = Toluene-D8

80-128%

S4 = 4-Bromofluorobenzene

67-131%

6.6.1
6

Initial Calibration Summary

Page 1 of 5

Job Number: JB39439

Sample: VD8524-ICC8524

Account: AQTAW Aquaterra Technologies, Inc.

Lab FileID: D208875.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSD

Method : C:\MSDCHEM\1\METHODS\MD8524.M (RTE Integrator)

Title : SW-846 Method 8260B

Last Update : Wed May 15 14:00:07 2013

Response via : Initial Calibration

Calibration Files

5	=d208872.D	2	=d208871.D	0.5	=d208869.D	50	=d208875.D
100	=d208876.D	1	=d208870.D	200	=d208877.D	20	=d208874.D
10	=d208873.D		=				

Compound

	5	2	0.5	50	100	1	200	20	10	Avg	%RSD
<hr/>											
1) I Tert Butyl Alcohol-d9						-----ISTD-----					
2) 1,4-dioxane			0.079		0.082	0.094		0.102	0.079	0.088	0.087
3) tertiary butyl alcohol			1.146	1.222	1.195	1.214	0.998	1.079	1.175	1.309	1.167
4) I pentafluorobenzene						-----ISTD-----					
5) 1,2-dichloro-1,2,2-trifluoroet										0.000#	-1.00
6) chlorodifluoromethane		0.378	0.410		0.429	0.417	0.334	0.407	0.391	0.372	0.392
7) dichlorodifluoromethane		0.474	0.506		0.550	0.559		0.546	0.505	0.515	0.522
8) chloromethane		0.430	0.460	0.396	0.458	0.483	0.456	0.505	0.430	0.434	0.450
9) vinyl chloride		0.479	0.536	0.570	0.585	0.613	0.458	0.660	0.522	0.513	0.548
10) bromomethane		0.263	0.257	0.290	0.311	0.319	0.270	0.345	0.285	0.292	0.293
11) chloroethane		0.233	0.239	0.247	0.265	0.270	0.179	0.283	0.240	0.258	0.246
12) vinyl bromide										0.000#	-1.00
13) trichlorofluoromethane		0.466	0.574		0.655	0.656		0.683	0.606	0.577	0.602
14) pentane		0.600	0.754		0.601		0.708	0.598	0.642	0.600	0.643
15) ethyl ether		0.248	0.260		0.259	0.244	0.264	0.243	0.237	0.237	0.249
16) acrolein		0.091	0.095		0.091	0.093	0.089	0.104	0.085	0.084	0.091
17) chlorotrifluoroethene										0.000#	-1.00
18) 2-chloropropane		0.705	0.586		0.711	0.667	0.853	0.657	0.668	0.687	0.692
19) 1,1-dichloroethene		0.383	0.337	0.428	0.388	0.361	0.336	0.361	0.358	0.371	0.369
20) acetone		0.034			0.044	0.039		0.037	0.037	0.045	0.039
21) allyl chloride		0.760			0.751	0.681		0.784	0.709	0.657	0.724
22) acetonitrile		0.024	0.033		0.025	0.024		0.022	0.025	0.027	0.026
23) acetaldehyde											13.54

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Initial Calibration Summary

Page 2 of 5

Job Number: JB39439

Sample: VD8524-ICC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208875.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

24)	iodomethane									0.000#	-1.00	
		0.707	0.591		0.782	0.750	0.540	0.733	0.703	0.720	0.691	11.93
25)	iso-butyl alcohol										0.000#	-1.00
26)	carbon disulfide				1.297	1.217	0.996	1.185	1.212	1.210	1.172	8.59
27)	methylene chloride				0.446	0.408	0.399	0.398	0.398	0.434	0.409	4.97
28)	1-chloropropane				0.726	0.680	0.615	0.653	0.682	0.674	0.657	7.92
29)	methyl acetate				0.344	0.324	0.415	0.314	0.316	0.338	0.346	9.71
30)	methyl tert butyl ether				1.330	1.127	1.108	1.435	1.336	0.973	1.315	1.323
31)	trans-1,2-dichloroethene				0.441	0.404	0.376	0.419	0.411	0.422	0.422	6.07
32)	di-isopropyl ether				1.327	1.141	1.017	1.366	1.336	1.054	1.337	1.251
33)	ethyl tert-butyl ether				1.310	1.197	1.033	1.415	1.380	1.106	1.377	1.302
34)	2-butanone				0.058	0.055		0.055	0.049	0.045	0.049	17.17
		0.035										
		----- Linear regression -----						Coefficient =	0.9996			
		Response Ratio = -0.00128 + 0.05545 *A										
35)	1,1-dichloroethane				0.755	0.735	0.565	0.772	0.710	0.697	0.690	11.16
36)	chloroprene				0.586	0.557		0.645	0.629	0.478	0.627	0.575
37)	acrylonitrile				0.142	0.131		0.171	0.160	0.112	0.157	0.152
38)	vinyl acetate				0.078		0.098	0.092		0.094	0.085	0.086
39)	ethyl acetate				0.061	0.064		0.070	0.064		0.070	0.055
40)	2,2-dichloropropane				0.650	0.537		0.655	0.636	0.520	0.623	0.611
41)	cis-1,2-dichloroethene				0.473	0.322	0.478	0.464	0.460	0.474	0.466	0.435
42)	propionitrile				0.058	0.049		0.066	0.065		0.066	0.059
43)	bromochloromethane				0.214	0.198		0.243	0.242		0.232	0.218
44)	tetrahydrofuran				0.055	0.062		0.061	0.062		0.059	0.055
45)	chloroform				0.710	0.607	0.563	0.751	0.735	0.626	0.703	0.692
46)	dibromofluoromethane (s)				0.367	0.333		0.397	0.394	0.394	0.377	0.379
47)	1,2-dichloroethane-d4 (s)				0.474	0.398		0.504	0.478	0.424	0.461	0.495
48)	freon 113				0.251	0.233		0.306	0.303		0.279	0.279
49)	methacrylonitrile				0.270	0.243		0.274	0.270	0.238	0.257	0.256
50)	t-butyl formate				0.396	0.333		0.446	0.438	0.295	0.414	0.390
51)	1,1,1-trichloroethane				0.653	0.539	0.546	0.684	0.688	0.518	0.645	0.630

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Initial Calibration Summary

Page 3 of 5

Job Number: JB39439

Sample: VD8524-ICC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208875.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

52)	tert-amyl methyl ether	1.372	1.163	1.244	1.434	1.391	1.109	1.352	1.311	1.354	1.303	8.38
53)	I 1,4-difluorobenzene											
54)	cyclohexane	0.404	0.372		0.465	0.475	0.325	0.438	0.431	0.433	0.418	11.86
55)	tert amyl alcohol	0.012			0.014	0.013		0.012	0.012	0.014	0.013	8.58
56)	2,2,4-trimethylpentane	0.910	0.856		1.068	1.102	0.941	0.973	0.906	0.826	0.948	10.19
57)	epichlorohydrin	0.032			0.036	0.035	0.024	0.034	0.033	0.033	0.032	12.44
58)	n-butyl alcohol	0.009	0.008		0.010	0.010		0.010	0.009	0.009	0.009#	8.33
59)	carbon tetrachloride	0.416	0.349		0.473	0.461	0.325	0.436	0.426	0.412	0.412	12.42
60)	1,1-dichloropropene	0.416	0.353	0.277	0.431	0.423	0.303	0.410	0.398	0.383	0.377	14.55
61)	hexane	0.344	0.335	0.334	0.368	0.377	0.391	0.336	0.323	0.286	0.344	9.17
62)	benzene	1.174	1.001	0.807	1.242	1.209	1.198	1.185	1.141	1.129	1.121	12.17
63)	heptane	0.203	0.184		0.211	0.218	0.171	0.193	0.194	0.176	0.194	8.60
64)	isopropyl acetate	0.569	0.587	0.621	0.629	0.615	0.545	0.584	0.589	0.600	0.593	4.47
65)	1,2-dichloroethane	0.432	0.351		0.468	0.449	0.325	0.431	0.431	0.432	0.415	11.97
66)	Ethyl Acrylate	0.389	0.323		0.435	0.416	0.280	0.416	0.405	0.399	0.383	13.96
67)	trichloroethene	0.294	0.255	0.226	0.314	0.309	0.239	0.301	0.286	0.299	0.280	11.48
68)	2-nitropropane	0.615	0.448		0.646	0.623		0.655	0.553	0.527	0.581	12.93
69)	2-chloroethyl vinyl ether	0.143	0.121		0.153	0.154		0.163	0.136	0.130	0.143	10.30
70)	methyl methacrylate	0.085	0.066		0.103	0.103		0.097	0.090	0.089	0.090	14.30
71)	tert-amyl ethyl ether	0.493	0.442	0.445	0.555	0.527	0.461	0.530	0.504	0.506	0.496	7.97
72)	1,2-dichloropropane	0.301	0.227	0.232	0.321	0.313	0.230	0.302	0.285	0.285	0.277	13.51
73)	methylcyclohexane	0.468	0.419		0.528	0.541	0.437	0.480	0.466	0.426	0.470	9.50
74)	dibromomethane	0.180	0.148		0.202	0.195	0.133	0.188	0.184	0.184	0.177	13.49
75)	bromodichloromethane	0.406	0.345		0.443	0.428	0.305	0.428	0.403	0.407	0.396	11.82
76)	cis-1,3-dichloropropene	0.517	0.431		0.563	0.532	0.389	0.521	0.503	0.518	0.497	11.56
77)	toluene-d8 (s)	1.029	0.945		1.126	1.080	0.971	1.056	1.047	1.022	1.034	5.58
78)	4-methyl-2-pentanone	0.111			0.141	0.128		0.129	0.126	0.122	0.126	7.62
79)	toluene	0.768	0.646	0.529	0.833	0.782	0.645	0.763	0.752	0.754	0.719	13.09
80)	3-methyl-1-butanol	0.007	0.006		0.011	0.011		0.011	0.009	0.009	0.009#	19.22
		----- Linear regression ----- Coefficient = 0.9997										
		Response Ratio = -0.00512 + 0.01061 *A										

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Initial Calibration Summary

Page 4 of 5

Job Number: JB39439

Sample: VD8524-ICC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208875.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

81)	trans-1,3-dichloropropene	0.474	0.355	0.540	0.509	0.368	0.498	0.470	0.478	0.462	14.23
82)	ethyl methacrylate	0.413	0.324	0.479	0.446		0.441	0.415	0.440	0.423	11.51
83)	1,1,2-trichloroethane	0.220	0.179	0.243	0.228	0.175	0.225	0.219	0.215	0.213	11.20
84)	2-hexanone	0.093		0.122	0.117		0.118	0.101	0.128	0.113	11.63
85)	I chlorobenzene-d5										
86)	tetrachloroethene	0.424	0.361	0.320	0.459	0.437	0.333	0.436	0.433	0.437	0.405
87)	1,3-dichloropropane	0.499	0.431	0.578	0.545	0.378	0.539	0.527	0.549	0.506	13.39
88)	butyl acetate	0.199		0.240	0.232		0.234	0.212	0.215	0.222	7.09
89)	3,3-dimethyl-1-butanol	0.033	0.033	0.038	0.040		0.042	0.033	0.032	0.036	11.67
90)	dibromochloromethane	0.358	0.305	0.429	0.411	0.305	0.410	0.386	0.398	0.375	12.76
91)	1,2-dibromoethane	0.305	0.236	0.354	0.335		0.332	0.317	0.336	0.316	12.21
92)	chlorobenzene	0.936	0.836	1.049	1.020	0.694	0.984	0.961	0.964	0.930	12.30
93)	1,1,1,2-tetrachloroethane	0.350	0.316	0.409	0.402	0.311	0.389	0.377	0.381	0.367	10.19
94)	ethylbenzene	1.489	1.317	1.199	1.683	1.662	1.323	1.615	1.573	1.565	1.492
95)	m,p-xylene	0.617	0.551	0.467	0.709	0.695	0.516	0.677	0.658	0.668	0.617
96)	o-xylene	0.620	0.530	0.477	0.706	0.686	0.501	0.692	0.648	0.645	0.612
97)	styrene	1.004	0.921	1.197	1.164	0.845	1.186	1.069	1.092	1.060	12.10
98)	bromoform	0.290	0.262	0.347	0.336		0.332	0.311	0.322	0.314	9.44
99)	I 1,4-dichlorobenzene-d										
100)	isopropylbenzene	2.816	2.436	2.430	2.897	2.751	2.515	2.652	2.740	2.773	2.668
101)	4-bromofluorobenzene (s)	0.693	0.726	0.779	0.761	0.673	0.736	0.763	0.759	0.736	5.07
102)	bromobenzene	0.777	0.639	0.609	0.828	0.790	0.627	0.789	0.778	0.799	0.737
103)	cyclohexanone	0.053	0.068	0.046	0.071		0.063	0.073	0.085	0.066	19.70
		----- Quadratic regression -----								Coefficient =	0.9894
		Response Ratio = -0.01071 + 0.06723 *A + -0.00009 *A^2									
104)	1,1,2,2-tetrachloroethane	0.756	0.694	0.647	0.765	0.721	0.728	0.690	0.709	0.766	0.719
105)	trans-1,4-dichloro-2-butene	0.176	0.131	0.205	0.208		0.204	0.187	0.190	0.186	14.35
106)	1,2,3-trichloropropane	0.219	0.200	0.234	0.224	0.188	0.219	0.220	0.238	0.218	7.68
107)	n-propylbenzene	3.035	2.724	2.407	3.197	3.071	2.547	3.077	3.066	3.006	2.903
108)	p-ethyltoluene	2.536	2.376	2.772	2.633	2.269	2.734	2.667	2.572	2.570	6.74

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Initial Calibration Summary

Page 5 of 5

Job Number: JB39439

Sample: VD8524-ICC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208875.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

109)	2-chlorotoluene		0.658	0.614	0.733	0.704	0.581	0.685	0.685	0.673	0.667	7.33	
110)	4-chlorotoluene		1.978	1.928	2.087	1.984	1.912	1.951	1.994	1.966	1.975	2.70	
111)	1,3,5-trimethylbenzene		2.568	2.259	2.972	2.549	2.477	2.378	2.340	2.426	2.482	2.495	8.20
112)	tert-butylbenzene		2.179	1.950	1.803	2.316	2.245	1.913	2.182	2.209	2.161	2.106	8.25
113)	pentachloroethane		0.529	0.512	0.536	0.579	0.562	0.466	0.550	0.530	0.540	0.534	6.05
114)	1,2,4-trimethylbenzene		2.467	2.265	2.122	2.584	2.511	2.254	2.430	2.433	2.434	2.389	6.10
115)	sec-butylbenzene		3.102	2.787	2.485	3.179	3.114	2.699	3.002	3.001	2.953	2.925	7.73
116)	1,3-dichlorobenzene		1.397	1.306	1.186	1.547	1.497	1.274	1.439	1.438	1.438	1.391	8.24
117)	p-isopropyltoluene		2.645	2.432	1.970	2.804	2.763	2.251	2.628	2.611	2.565	2.519	10.51
118)	1,4-dichlorobenzene		1.488	1.382	1.457	1.604	1.554	1.498	1.495	1.521	1.536	1.504	4.15
119)	Benzyl Chloride		1.261	1.203		1.447	1.457	1.035	1.382	1.281	1.173	1.280	11.34
120)	p-diethylbenzene		1.498	1.496		1.744	1.665	1.410	1.632	1.586	1.512	1.568	6.95
121)	1,2-dichlorobenzene		1.432	1.290	1.153	1.541	1.490	1.254	1.391	1.412	1.420	1.376	8.86
122)	n-butylbenzene		1.128	1.002		1.360	1.357	0.958	1.263	1.253	1.158	1.185	12.78
123)	1,2,4,5-tetramethylbenzene		2.226	2.193	2.337	2.721	2.562	1.943	2.391	2.433	2.250	2.339	9.62
124)	1,2-dibromo-3-chloropropane		0.136	0.161	0.119	0.147	0.147	0.109	0.132	0.140	0.137	0.136	11.27
125)	1,3,5-trichlorobenzene		1.038	0.865		1.239	1.197		1.073	1.138	1.026	1.082	11.53
126)	1,2,4-trichlorobenzene		0.680			0.984	0.972		0.913	0.830	0.735	0.852	14.79
127)	hexachlorobutadiene		0.534	0.474		0.598	0.566	0.438	0.522	0.554	0.504	0.524	9.85
128)	naphthalene		1.227			1.884	1.876		1.811	1.513	1.319	1.605	18.20
			-----	Linear regression	-----	Coefficient =	0.9990						
						Response Ratio =	-0.05237 + 1.84228 *A						
129)	1,2,3-trichlorobenzene		0.560		0.792	0.794		0.764	0.674	0.588	0.695	15.00	
			-----	Linear regression	-----	Coefficient =	0.9991						
						Response Ratio =	-0.01528 + 0.77576 *A						
130)	hexachloroethane		0.509	0.491		0.536	0.531	0.559	0.499	0.502	0.475	0.513	5.33

(#) = Out of Range ### Number of calibration levels exceeded format ###

MD8524.M

Wed May 15 14:01:41 2013

Initial Calibration Verification

Page 1 of 3

Job Number: JB39439

Sample: VD8524-ICV8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208880.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\d208880.D Vial: 13
Acq On : 14 May 2013 11:31 pm Operator: EmilyT
Sample : icv8524-50 Inst : MSD
Misc : ms48015, vd8524, 5,,100,5,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\MD8524.M (RTE Integrator)
Title : SW-846 Method 8260B
Last Update : Wed May 15 14:00:07 2013
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.	
1 I	Tert Butyl Alcohol-d9	1.000	1.000	0.0	103	0.00	7.99	
2 M	1,4-dioxane	0.087	0.085	2.3	106	0.00	11.86	
3 M	tertiary butyl alcohol	1.167	1.228	-5.2	106	0.00	8.11	
4 I	pentafluorobenzene	1.000	1.000	0.0	104	0.00	10.22	
5 M	1,2-dichloro-1,2,2-triflu			-----NA-----				
6 M	chlorodifluoromethane	0.392	0.468	-19.4	114	0.00	4.55	
7 M	dichlorodifluoromethane	0.522	0.536	-2.7	102	-0.01	4.54	
8 M	chloromethane	0.450	0.500	-11.1	114	0.00	4.88	
9 M	vinyl chloride	0.548	0.620	-13.1	111	0.00	5.17	
10 M	bromomethane	0.293	0.317	-8.2	106	0.00	5.84	
11 M	chloroethane	0.246	0.272	-10.6	108	0.00	6.02	
12 M	vinyl bromide			-----NA-----				
13 M	trichlorofluoromethane	0.602	0.680	-13.0	108	0.00	6.53	
14	pentane	0.643	0.615	4.4	107	0.00	6.62	
15 M	ethyl ether	0.249	0.263	-5.6	106	0.00	6.93	
16 M	acrolein	0.091	0.093	-2.2	107	0.00	7.15	
17 M	chlorotrifluoroethylene			-----NA-----				
18 M	2-chloropropane	0.692	0.693	-0.1	102	0.00	7.12	
19 M	1,1-dichloroethene	0.369	0.392	-6.2	106	0.00	7.36	
20 M	acetone	0.039	0.040	-2.6	96	0.00	7.37	
21 M	allyl chloride	0.724	0.709	2.1	99	0.00	7.87	
22 M	acetonitrile	0.026	0.024	7.7	98	0.00	7.79	
23 M	acetaldehyde			-----NA-----				
24 M	iodomethane	0.691	0.776	-12.3	103	0.00	7.62	
25 M	iso-butyl alcohol			-----NA-----				
26 M	carbon disulfide	1.172	1.311	-11.9	106	0.00	7.76	
27 M	methylene chloride	0.409	0.424	-3.7	99	0.00	8.04	
28 M	1-chloropropane	0.657	0.710	-8.1	102	0.00	8.10	
29 M	methyl acetate	0.346	0.322	6.9	98	0.00	7.84	
30 M	methyl tert butyl ether	1.259	1.373	-9.1	100	0.00	8.40	
31 M	trans-1,2-dichloroethene	0.422	0.425	-0.7	101	0.00	8.43	
32 M	di-isopropyl ether	1.232	1.321	-7.2	101	0.00	9.00	
33 M	ethyl tert-butyl ether	1.275	1.363	-6.9	100	0.00	9.46	
34 M	2-butanone	50.000	48.999	True	Calc.	% Drift		
35 M	1,1-dichloroethane	0.690	0.753	-9.1	104	0.00	8.98	
36 M	chloroprene	0.582	0.599	-2.9	97	0.00	9.10	
37 M	acrylonitrile	0.147	0.167	-13.6	102	0.00	8.34	

Initial Calibration Verification

Job Number: JB39439

Sample: VD8524-ICV8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208880.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

38 M	vinyl acetate	0.089	0.087	2.2	93	0.00	8.97
39 M	ethyl acetate	0.063	0.063	0.0	95	0.00	9.70
40 M	2,2-dichloropropane	0.603	0.597	1.0	95	0.00	9.73
41 M	cis-1,2-dichloroethene	0.446	0.453	-1.6	102	0.00	9.70
42 M	propionitrile	0.060	0.063	-5.0	100	0.00	9.74
43 M	bromochloromethane	0.225	0.234	-4.0	101	0.00	10.00
44 M	tetrahydrofuran	0.058	0.058	0.0	100	0.00	10.07
45 M	chloroform	0.677	0.718	-6.1	100	0.00	10.06
46 S	dibromofluoromethane (s)	0.373	0.395	-5.9	104	0.00	10.25
47 S	1,2-dichloroethane-d4 (s)	0.464	0.483	-4.1	100	0.00	10.68
48 M	freon 113	0.270	0.275	-1.9	94	0.00	7.35
49 M	methacrylonitrile	0.260	0.258	0.8	98	0.00	9.94
50 m	t-butyl formate	0.387	0.441	-14.0	103	0.00	10.13
51 M	1,1,1-trichloroethane	0.616	0.691	-12.2	105	0.00	10.35
52 M	tert-amyl methyl ether	1.303	1.400	-7.4	102	0.00	10.83
53 I	1,4-difluorobenzene	1.000	1.000	0.0	103	0.00	11.14
54 M	cyclohexane	0.418	0.445	-6.5	99	0.00	10.44
55	tert amyl alcohol	0.013	0.013	0.0	96	0.00	10.63
56 M	2,2,4-trimethylpentane	0.948	0.873	7.9	84	0.00	10.83
57 M	epichlorohydrin	0.032	0.035	-9.4	103	0.00	12.39
58 M	n-butyl alcohol	0.009	0.010#	-11.1	104	0.00	11.23
59 M	carbon tetrachloride	0.412	0.454	-10.2	99	0.00	10.56
60 M	1,1-dichloropropene	0.377	0.423	-12.2	101	0.00	10.52
61 M	hexane	0.344	0.320	7.0	90	0.00	8.76
62 M	benzene	1.121	1.215	-8.4	101	0.00	10.78
63 M	heptane	0.194	0.164	15.5	80	0.00	10.99
64 M	isopropyl acetate	0.593	0.583	1.7	96	0.00	10.69
65 M	1,2-dichloroethane	0.415	0.447	-7.7	98	0.00	10.77
66	Ethyl Acrylate	0.383	0.433	-13.1	103	0.00	11.48
67 M	trichloroethene	0.280	0.311	-11.1	102	0.00	11.49
68 M	2-nitropropane	0.581	0.641	-10.3	102	0.00	12.28
69 M	2-chloroethyl vinyl ether	0.143	0.153	-7.0	103	0.00	12.28
70 M	methyl methacrylate	0.090	0.101	-12.2	101	0.00	11.76
71 M	tert-amyl ethyl ether	0.496	0.545	-9.9	101	0.00	11.68
72 M	1,2-dichloropropene	0.277	0.316	-14.1	102	0.00	11.75
73 M	methylcyclohexane	0.470	0.481	-2.3	94	0.00	11.75
74 M	dibromomethane	0.177	0.192	-8.5	98	0.00	11.90
75 M	bromodichloromethane	0.396	0.439	-10.9	102	0.00	12.03
76 M	cis-1,3-dichloropropene	0.497	0.536	-7.8	98	0.00	12.51
77 S	toluene-d8 (s)	1.034	1.126	-8.9	103	0.00	12.84
78 M	4-methyl-2-pentanone	0.126	0.132	-4.8	96	0.00	12.62
79 M	toluene	0.719	0.801	-11.4	99	0.00	12.92
----- True Calc. % Drift -----							
80 M	3-methyl-1-butanol	1000.000	995.844	0.4	98	0.00	12.62
----- AvgRF CCRF % Dev -----							
81 M	trans-1,3-dichloropropene	0.462	0.518	-12.1	99	0.00	13.10
82 M	ethyl methacrylate	0.423	0.457	-8.0	98	0.00	13.12
83 M	1,1,2-trichloroethane	0.213	0.233	-9.4	99	0.00	13.33
84 M	2-hexanone	0.113	0.113	0.0	96	0.00	13.53
85 I	chlorobenzene-d5	1.000	1.000	0.0	102	0.00	14.48
86 M	tetrachloroethene	0.405	0.450	-11.1	100	0.00	13.56
87 M	1,3-dichloropropane	0.506	0.549	-8.5	97	0.00	13.53
88 M	butyl acetate	0.222	0.223	-0.5	95	0.00	13.62
89 m	3,3-dimethyl-1-butanol	0.036	0.036	0.0	95	0.00	13.71
90 M	dibromochloromethane	0.375	0.419	-11.7	100	0.00	13.82
91 M	1,2-dibromoethane	0.316	0.336	-6.3	97	0.00	13.99

Initial Calibration Verification

Job Number: JB39439

Sample: VD8524-ICV8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D208880.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

92 M	chlorobenzene	0.930	1.019	-9.6	99	0.00	14.51
93 M	1,1,1,2-tetrachloroethane	0.367	0.402	-9.5	100	0.00	14.58
94 M	ethylbenzene	1.492	1.642	-10.1	99	0.00	14.59
95 M	m,p-xylene	0.617	0.708	-14.7	102	0.00	14.71
96 M	o-xylene	0.612	0.685	-11.9	99	0.00	15.17
97 M	styrene	1.060	1.156	-9.1	98	0.00	15.17
98 M	bromoform	0.314	0.336	-7.0	99	0.00	15.44
99 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	102	0.00	17.06
100 M	isopropylbenzene	2.668	2.813	-5.4	99	0.00	15.55
101 S	4-bromofluorobenzene (s)	0.736	0.756	-2.7	99	0.00	15.76
102 M	bromobenzene	0.737	0.793	-7.6	98	0.00	15.98

		True	Calc.	% Drift		
103 M	cyclohexanone	500.000	393.773	21.2#	114	0.00

		AvgRF	CCRF	% Dev		
104 M	1,1,2,2-tetrachloroethane	0.719	0.728	-1.3	97	0.00
105 M	trans-1,4-dichloro-2-bute	0.186	0.197	-5.9	98	0.00
106 M	1,2,3-trichloropropane	0.218	0.231	-6.0	101	0.00
107 M	n-propylbenzene	2.903	3.117	-7.4	100	0.00
108 M	p-ethyltoluene	2.570	2.785	-8.4	103	0.00
109 M	2-chlorotoluene	0.667	0.716	-7.3	100	0.00
110 M	4-chlorotoluene	1.975	1.982	-0.4	97	0.00
111 M	1,3,5-trimethylbenzene	2.495	2.526	-1.2	101	0.00
112 M	tert-butylbenzene	2.106	2.267	-7.6	100	0.00
113 M	pentachloroethane	0.534	0.552	-3.4	98	0.00
114 M	1,2,4-trimethylbenzene	2.389	2.505	-4.9	99	0.00
115 M	sec-butylbenzene	2.925	3.132	-7.1	101	0.00
116 M	1,3-dichlorobenzene	1.391	1.505	-8.2	100	0.00
117 M	p-isopropyltoluene	2.519	2.790	-10.8	102	0.00
118 M	1,4-dichlorobenzene	1.504	1.571	-4.5	100	0.00
119	Benzyl Chloride	1.280	1.315	-2.7	93	0.00
120 M	p-diethylbenzene	1.568	1.782	-13.6	105	0.00
121 M	1,2-dichlorobenzene	1.376	1.500	-9.0	100	0.00
122 M	n-butylbenzene	1.185	1.349	-13.8	102	0.00
123 M	1,2,4,5-tetramethylbenzen	2.339	2.753	-17.7	104	0.00
124 M	1,2-dibromo-3-chloropropane	0.136	0.146	-7.4	102	0.00
125 M	1,3,5-trichlorobenzene	1.082	1.240	-14.6	103	0.00
126 M	1,2,4-trichlorobenzene	0.852	0.968	-13.6	101	0.00
127 M	hexachlorobutadiene	0.524	0.611	-16.6	105	0.00

		True	Calc.	% Drift		
128 M	naphthalene	50.000	50.360	-0.7	98	0.00
129 M	1,2,3-trichlorobenzene	50.000	50.981	-2.0	100	0.00

		AvgRF	CCRF	% Dev		
130 M	hexachloroethane	0.513	0.528	-2.9	101	0.00

(#) = Out of Range
d208875.D MD8524.M

SPCC's out = 0 CCC's out = 0
Wed May 15 14:02:07 2013

6.7.2
6

Continuing Calibration Summary

Page 1 of 3

Job Number: JB39439

Sample: VD8577-CC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D210103.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\d210103.D Vial: 2
 Acq On : 17 Jun 2013 11:34 am Operator: EmilyT
 Sample : cc8524-20 Inst : MSD
 Misc : ms49823, vd8577, 5,,100,5,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\MD8524.M (RTE Integrator)
 Title : SW-846 Method 8260B
 Last Update : Fri Jun 14 10:55:14 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.	
1 I	Tert Butyl Alcohol-d9	1.000	1.000	0.0	98	0.00	7.99	
2 M	1,4-dioxane	0.087	0.069	20.7#	86	0.00	11.85	
3 M	tertiary butyl alcohol	1.167	1.124	3.7	94	-0.01	8.10	
4 I	pentafluorobenzene	1.000	1.000	0.0	93	0.00	10.22	
5 M	1,2-dichloro-1,2,2-triflu			-----NA-----				
6 M	chlorodifluoromethane	0.392	0.362	7.7	86	-0.04	4.51	
7 M	dichlorodifluoromethane	0.522	0.542	-3.8	100	-0.03	4.52	
8 M	chloromethane	0.450	0.477	-6.0	103	0.00	4.89	
9 M	vinyl chloride	0.548	0.536	2.2	96	0.00	5.17	
10 M	bromomethane	0.293	0.309	-5.5	101	0.00	5.85	
11 M	chloroethane	0.246	0.261	-6.1	101	0.00	6.04	
12 M	vinyl bromide			-----NA-----				
13 M	trichlorofluoromethane	0.602	0.720	-19.6	110	-0.04	6.49	
14	pentane			-----NA-----				
15 M	ethyl ether	0.249	0.211	15.3	83	0.00	6.93	
16 M	acrolein	0.091	0.080	12.1	88	0.00	7.15	
17 M	chlorotrifluoroethylene			-----NA-----				
18 M	2-chloropropane	0.692	0.607	12.3	85	0.00	7.12	
19 M	1,1-dichloroethene	0.369	0.336	8.9	87	-0.02	7.35	
20 M	acetone	0.039	0.038	2.6	97	0.00	7.38	
21 M	allyl chloride	0.724	0.676	6.6	89	0.00	7.87	
22 M	acetonitrile	0.026	0.021	19.2	80	0.00	7.80	
23 M	acetaldehyde			-----NA-----				
24 M	iodomethane	0.691	0.703	-1.7	93	0.00	7.62	
25 M	iso-butyl alcohol			-----NA-----				
26 M	carbon disulfide	1.172	1.091	6.9	84	-0.01	7.75	
27 M	methylene chloride	0.409	0.367	10.3	86	-0.01	8.03	
28 M	1-chloropropane	0.657	0.682	-3.8	93	0.00	8.09	
29 M	methyl acetate	0.346	0.298	13.9	88	0.00	7.84	
30 M	methyl tert butyl ether	1.259	1.250	0.7	88	0.00	8.40	
31 M	trans-1,2-dichloroethene	0.422	0.367	13.0	83	0.00	8.42	
32 M	di-isopropyl ether	1.232	1.098	10.9	82	0.00	9.00	
33 M	ethyl tert-butyl ether	1.275	1.197	6.1	85	0.00	9.45	
34 M	2-butanone	True 20.000	Calc. 20.293	% Drift -1.5	100	0.00	9.66	
35 M	1,1-dichloroethane	AvgRF 0.690	CCRF 0.646	% Dev 6.4	85	0.00	8.98	
36 M	chloroprene	0.582	0.549	5.7	89	-0.01	9.09	
37 M	acrylonitrile	0.147	0.148	-0.7	91	0.00	8.33	

Continuing Calibration Summary

Page 2 of 3

Job Number: JB39439

Sample: VD8577-CC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D210103.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

38 M	vinyl acetate	0.089	0.081	9.0	89	-0.01	8.96
39 M	ethyl acetate	0.063	0.050	20.6#	86	-0.01	9.69
40 M	2,2-dichloropropane	0.603	0.561	7.0	85	0.00	9.73
41 M	cis-1,2-dichloroethene	0.446	0.412	7.6	88	-0.01	9.69
42 M	propionitrile	0.060	0.060	0.0	95	0.00	9.74
43 M	bromochloromethane	0.225	0.218	3.1	93	-0.01	9.99
44 M	tetrahydrofuran	0.058	0.057	1.7	95	0.00	10.06
45 M	chloroform	0.677	0.697	-3.0	94	0.00	10.06
46 S	dibromofluoromethane (s)	0.373	0.382	-2.4	94	0.00	10.25
47 S	1,2-dichloroethane-d4 (s)	0.464	0.517	-11.4	97	0.00	10.67
48 M	freon 113	0.270	0.274	-1.5	91	-0.02	7.33
49 M	methacrylonitrile	0.260	0.246	5.4	89	0.00	9.94
50 m	t-butyl formate	0.387	0.401	-3.6	96	0.00	10.12
51 M	1,1,1-trichloroethane	0.616	0.648	-5.2	96	0.00	10.34
52 M	tert-amyl methyl ether	1.303	1.201	7.8	85	-0.01	10.82
53 I	1,4-difluorobenzene	1.000	1.000	0.0	88	0.00	11.13
54 M	cyclohexane	0.418	0.385	7.9	79	-0.01	10.44
55	tert amyl alcohol			-----NA-----			
56 M	2,2,4-trimethylpentane	0.948	0.647	31.8#	63	-0.01	10.82
57 M	epichlorohydrin	0.032	0.034	-6.3	92	0.00	12.40
58 M	n-butyl alcohol	0.009	0.010#	-11.1	100	0.00	11.23
59 M	carbon tetrachloride	0.412	0.479	-16.3	100	0.00	10.55
60 M	1,1-dichloropropene	0.377	0.400	-6.1	89	0.00	10.52
61 M	hexane	0.344	0.303	11.9	83	0.00	8.76
62 M	benzene	1.121	1.119	0.2	87	0.00	10.78
63 M	heptane	0.194	0.331	-70.6#	151	0.00	10.98
64 M	isopropyl acetate	0.593	0.578	2.5	87	0.00	10.69
65 M	1,2-dichloroethane	0.415	0.484	-16.6	99	-0.01	10.76
66	Ethyl Acrylate			-----NA-----			
67 M	trichloroethene	0.280	0.287	-2.5	89	0.00	11.49
68 M	2-nitropropane	0.581	0.654	-12.6	105	0.00	12.28
69 M	2-chloroethyl vinyl ether	0.143	0.146	-2.1	94	0.00	12.28
70 M	methyl methacrylate	0.090	0.093	-3.3	91	0.00	11.76
71 M	tert-amyl ethyl ether			-----NA-----			
72 M	1,2-dichloropropane	0.277	0.276	0.4	86	0.00	11.74
73 M	methylcyclohexane	0.470	0.424	9.8	81	0.00	11.75
74 M	dibromomethane	0.177	0.190	-7.3	92	0.00	11.89
75 M	bromodichloromethane	0.396	0.447	-12.9	98	0.00	12.02
76 M	cis-1,3-dichloropropene	0.497	0.504	-1.4	89	0.00	12.51
77 S	toluene-d8 (s)	1.034	1.132	-9.5	96	0.00	12.84
78 M	4-methyl-2-pentanone	0.126	0.129	-2.4	91	0.00	12.63
79 M	toluene	0.719	0.763	-6.1	90	0.00	12.92
		-----	True	Calc.	% Drift	-----	
80 M	3-methyl-1-butanol	400.000	372.666	6.8	90	0.00	12.62
		-----	AvgRF	CCRF	% Dev	-----	
81 M	trans-1,3-dichloropropene	0.462	0.500	-8.2	94	0.00	13.09
82 M	ethyl methacrylate	0.423	0.407	3.8	87	0.00	13.12
83 M	1,1,2-trichloroethane	0.213	0.225	-5.6	91	0.00	13.32
84 M	2-hexanone	0.113	0.107	5.3	93	0.00	13.54
85 I	chlorobenzene-d5	1.000	1.000	0.0	90	0.00	14.47
86 M	tetrachloroethene	0.405	0.436	-7.7	91	0.00	13.55
87 M	1,3-dichloropropane	0.506	0.516	-2.0	88	0.00	13.53
88 M	butyl acetate	0.222	0.203	8.6	86	0.00	13.62
89 m	3,3-dimethyl-1-butanol	0.036	0.035	2.8	96	0.00	13.72
90 M	dibromochloromethane	0.375	0.413	-10.1	97	0.00	13.81
91 M	1,2-dibromoethane	0.316	0.345	-9.2	98	0.00	13.98

Continuing Calibration Summary

Job Number: JB39439

Sample: VD8577-CC8524

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: D210103.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

92 M	chlorobenzene	0.930	0.969	-4.2	91	0.00	14.51
93 M	1,1,1,2-tetrachloroethane	0.367	0.388	-5.7	93	0.00	14.57
94 M	ethylbenzene	1.492	1.579	-5.8	91	0.00	14.58
95 M	m,p-xylene	0.617	0.682	-10.5	94	0.00	14.70
96 M	o-xylene	0.612	0.686	-12.1	96	0.00	15.16
97 M	styrene	1.060	1.081	-2.0	91	0.00	15.17
98 M	bromoform	0.314	0.334	-6.4	97	0.00	15.43
99 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	91	0.00	17.06
100 M	isopropylbenzene	2.668	2.821	-5.7	94	0.00	15.55
101 S	4-bromofluorobenzene (s)	0.736	0.779	-5.8	93	0.00	15.76
102 M	bromobenzene	0.737	0.826	-12.1	97	0.00	15.98
-----		True	Calc.	% Drift	-----		
103 M	cyclohexanone	200.000	271.795	-35.9#	110	0.00	15.71
-----		AvgRF	CCRF	% Dev	-----		
104 M	1,1,2,2-tetrachloroethane	0.719	0.749	-4.2	96	0.00	15.84
105 M	trans-1,4-dichloro-2-bute	0.186	0.229	-23.1#	112	0.00	15.90
106 M	1,2,3-trichloropropane	0.218	0.240	-10.1	99	0.00	15.93
107 M	n-propylbenzene	2.903	3.069	-5.7	91	0.00	16.01
108 M	p-ethyltoluene			-----NA-----			
109 M	2-chlorotoluene	0.667	0.714	-7.0	95	0.00	16.16
110 M	4-chlorotoluene	1.975	1.960	0.8	90	0.00	16.27
111 M	1,3,5-trimethylbenzene	2.495	2.415	3.2	91	0.00	16.17
112 M	tert-butylbenzene	2.106	2.200	-4.5	91	0.00	16.57
113 M	pentachloroethane	0.534	0.572	-7.1	98	0.00	16.64
114 M	1,2,4-trimethylbenzene	2.389	2.466	-3.2	92	0.00	16.61
115 M	sec-butylbenzene	2.925	3.101	-6.0	94	0.00	16.81
116 M	1,3-dichlorobenzene	1.391	1.480	-6.4	94	0.00	17.00
117 M	p-isopropyltoluene	2.519	2.690	-6.8	94	0.00	16.94
118 M	1,4-dichlorobenzene	1.504	1.566	-4.1	94	0.00	17.09
119	Benzyl Chloride	1.280	1.624	-26.9#	116	0.00	17.21
120 M	p-diethylbenzene			-----NA-----			
121 M	1,2-dichlorobenzene	1.376	1.475	-7.2	95	0.00	17.52
122 M	n-butylbenzene	1.185	1.263	-6.6	92	0.00	17.40
123 M	1,2,4,5-tetramethylbenzen			-----NA-----			
124 M	1,2-dibromo-3-chloropropane	0.136	0.161	-18.4	105	0.00	18.37
125 M	1,3,5-trichlorobenzene	1.082	1.208	-11.6	97	0.00	18.61
126 M	1,2,4-trichlorobenzene	0.852	0.946	-11.0	104	0.00	19.33
127 M	hexachlorobutadiene	0.524	0.693	-32.3#	114	0.00	19.48
-----		True	Calc.	% Drift	-----		
128 M	naphthalene	20.000	21.550	-7.8	112	0.00	19.65
129 M	1,2,3-trichlorobenzene	20.000	21.631	-8.2	108	0.00	19.93
-----		AvgRF	CCRF	% Dev	-----		
130 M	hexachloroethane	0.513	0.520	-1.4	95	0.00	17.83

(#) = Out of Range
d208874.D MD8524.MSPCC's out = 0 CCC's out = 0
Mon Jun 17 15:49:43 2013

Initial Calibration Summary

Page 1 of 5

Job Number: JB39439

Sample: VI7473-ICC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I184954.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSI

Method : C:\MSDCHEM\1\METHODS\MI7473.M (RTE Integrator)
Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
Last Update : Fri Jun 28 12:42:55 2013
Response via : Initial Calibration

Calibration Files

0.5 =I184947.D	1 =I184948.D	2 =I184949.D	5 =I184950.D
10 =I184951.D	20 =I184955.D	50 =I184954.D	100 =I184953.D
200 =I184952.D	=		

Compound	0.5	1	2	5	10	20	50	100	200	Avg	%RSD
<hr/>											
1) I Tert Butyl Alcohol-d9											
2) tertiary butyl alcohol	1.029	1.154	0.944	1.041	0.994	1.019	1.053	1.000	1.029	5.89	
3) iso-butyl alcohol	0.193	0.256	0.209	0.246	0.228	0.245			0.229	10.71	
4) 1,4-dioxane	0.069	0.084	0.078	0.088	0.091	0.091	0.085		0.084	9.38	
5) I pentafluorobenzene											
6) chlorodifluoromethane	0.383	0.246	0.307	0.312	0.292	0.296	0.310	0.326	0.309	12.34	
7) dichlorodifluoromethane	0.472	0.436	0.214	0.562	0.525	0.568	0.549	0.579	0.488	24.88	
	----- Linear regression ----- Coefficient = 0.9993										
	Response Ratio = -0.01705 + 0.57833 *A										
8) chloromethane	0.443	0.313	0.441	0.390	0.407	0.407	0.411		0.402	10.87	
9) vinyl chloride	0.455	0.412	0.245	0.475	0.438	0.465	0.457	0.471	0.427	17.85	
	----- Linear regression ----- Coefficient = 0.9997										
	Response Ratio = -0.00879 + 0.47057 *A										
10) bromomethane	0.357	0.292	0.244	0.302	0.287	0.297	0.293	0.289	0.295	10.37	
11) chloroethane	0.172	0.153	0.115	0.185	0.171	0.182	0.177	0.177	0.166	13.75	
12) trichlorofluoromethane	0.578	0.560	0.284	0.670	0.600	0.646	0.633	0.649	0.578	21.56	
	----- Linear regression ----- Coefficient = 0.9997										
	Response Ratio = -0.01232 + 0.64995 *A										
13) ethyl ether	0.186	0.182	0.133	0.158	0.138	0.143	0.149	0.147	0.155	12.59	
14) acrolein	0.045	0.040	0.045	0.038	0.042	0.042	0.043		0.042	6.04	
15) freon 113	0.219	0.233	0.216	0.248	0.258	0.252	0.258	0.263	0.271	0.246	7.95
16) 1,1-dichloroethene	0.467	0.445	0.454	0.445	0.486	0.455	0.467	0.482	0.507	0.468	4.48
17) acetone	0.018	0.019	0.017	0.017	0.017	0.018	0.019		0.018	5.24	
18) iodomethane	0.596	0.600	0.594	0.599	0.639	0.620	0.644	0.656	0.666	0.624	4.49

6.7.4
6

Initial Calibration Summary

Page 2 of 5

Job Number: JB39439

Sample: VI7473-ICC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I184954.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

19)	carbon disulfide	1.051	1.082	1.057	1.046	1.148	1.073	1.100	1.137	1.169	1.096	4.13
20)	methyl acetate				0.031	0.041	0.034	0.034	0.037	0.038	0.036	9.80
21)	allyl chloride				0.168	0.158	0.180	0.163	0.172	0.175	0.180	0.171
22)	acetonitrile				0.064	0.059	0.067	0.044	0.045	0.046	0.049	0.053
		----- Linear regression ----- Coefficient = 0.9978										17.77
		Response Ratio = -0.00323 + 0.04847 *A										
23)	methylene chloride				0.408	0.342	0.353	0.330	0.333	0.342	0.340	0.350
24)	methyl tert butyl ether				1.043	0.967	0.980	0.865	0.929	0.846	0.904	0.919
25)	acrylonitrile				0.058	0.078	0.060	0.072	0.067	0.071	0.075	0.075
26)	trans-1,2-dichloroethene				0.376	0.371	0.341	0.331	0.348	0.330	0.331	0.342
27)	hexane				0.461	0.355	0.358	0.332	0.334	0.340	0.355	0.362
28)	di-isopropyl ether				0.905	0.843	0.840	0.807	0.857	0.811	0.855	0.873
29)	vinyl acetate				0.182	0.180	0.176	0.178	0.169	0.175	0.183	0.187
30)	1,1-dichloroethane				0.525	0.508	0.539	0.522	0.571	0.532	0.543	0.559
31)	chloroprene				0.395	0.391	0.431	0.443	0.425	0.447	0.463	0.492
32)	ethyl tert-butyl ether				0.882	0.947	0.998	0.872	0.989	0.928	0.983	1.004
33)	2-butanone					0.025	0.024	0.027	0.028	0.029	0.027	0.027
34)	ethyl acetate					0.025	0.027	0.026	0.028	0.027	0.029	0.027
35)	2,2-dichloropropane					0.535	0.559	0.527	0.531	0.565	0.516	0.535
36)	cis-1,2-dichloroethene					0.438	0.358	0.374	0.361	0.380	0.355	0.361
37)	methacrylonitrile					0.078	0.095	0.084	0.090	0.098	0.099	0.091
38)	propionitrile					0.025	0.029	0.026	0.028	0.030	0.030	0.028
39)	bromochloromethane					0.170	0.174	0.165	0.176	0.166	0.176	0.180
40)	tetrahydrofuran					0.071	0.072	0.064	0.066	0.070	0.071	0.069
41)	chloroform					0.665	0.637	0.652	0.602	0.630	0.602	0.611
42)	tert-Butyl Formate					0.214	0.234	0.245	0.207	0.238	0.226	0.245
43)	dibromofluoromethane (s)					0.356	0.351	0.344	0.344	0.344	0.359	0.350
44)	1,1,1-trichloroethane					0.500	0.520	0.530	0.546	0.599	0.564	0.582
45)	cyclohexane					0.399	0.421	0.433	0.449	0.467	0.463	0.465
46)	I 1,4-difluorobenzene											-----ISTD-----
47)	1,2-dichloroethane-d4 (s)											

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Initial Calibration Summary

Page 3 of 5

Job Number: JB39439

Sample: VI7473-ICC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I184954.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

48)	carbon tetrachloride	0.268	0.281	0.266	0.268	0.267	0.276	0.271	2.31
		0.374	0.338	0.345	0.353	0.388	0.373	0.388	0.404
49)	1,1-dichloropropene	0.278	0.316	0.294	0.299	0.325	0.317	0.323	0.337
		0.353	0.388	0.373	0.388	0.404	0.424	0.376	7.48
50)	isopropyl acetate								
		0.059	0.067	0.066	0.072	0.073	0.076	0.069	8.83
51)	benzene								
		0.954	0.941	0.903	0.890	0.952	0.922	0.943	0.968
52)	2,2,4-trimethylpentane	0.718	0.712	0.721	0.751	0.816	0.768	0.808	0.838
		0.721	0.751	0.816	0.768	0.808	0.838	0.886	0.780
53)	tert-amyl methyl ether	0.625	0.698	0.679	0.601	0.664	0.650	0.682	0.698
		0.679	0.601	0.664	0.650	0.682	0.698	0.716	0.668
54)	1,2-dichloroethane	0.321	0.302	0.314	0.298	0.328	0.305	0.320	0.329
		0.302	0.314	0.298	0.328	0.305	0.320	0.333	0.317
55)	heptane								
		0.152	0.161	0.150	0.155	0.160	0.171	0.158	4.87
56)	n-butyl alcohol								
		0.004	0.005	0.004	0.005	0.005	0.005	0.004#	12.16
57)	trichloroethylene	0.205	0.214	0.229	0.237	0.258	0.251	0.257	0.263
		0.229	0.237	0.258	0.251	0.257	0.263	0.270	0.243
58)	ethyl acrylate	0.277	0.259	0.284	0.311	0.289	0.305	0.319	0.332
		0.259	0.284	0.311	0.289	0.305	0.319	0.332	0.297
59)	methyl methacrylate								
		0.095	0.121	0.108	0.120	0.126	0.130	0.117	11.09
60)	1,2-dichloropropane	0.208	0.188	0.210	0.209	0.220	0.211	0.218	0.222
		0.210	0.209	0.220	0.211	0.218	0.222	0.224	0.212
61)	methylcyclohexane	0.327	0.347	0.330	0.355	0.377	0.372	0.392	0.401
		0.347	0.330	0.355	0.377	0.372	0.392	0.401	0.420
62)	dibromomethane	0.138	0.145	0.132	0.143	0.136	0.146	0.150	0.149
		0.145	0.132	0.143	0.136	0.146	0.150	0.149	0.142
63)	bromodichloromethane	0.271	0.315	0.319	0.301	0.333	0.322	0.344	0.352
		0.315	0.319	0.301	0.333	0.322	0.344	0.352	0.356
64)	2-nitropropane								
		0.063	0.072	0.061	0.068	0.070	0.072	0.068	6.70
65)	2-chloroethyl vinyl ether	0.075	0.084	0.071	0.084	0.075	0.084	0.086	0.090
		0.084	0.071	0.084	0.075	0.084	0.086	0.090	0.081
66)	epichlorohydrin								
		0.015	0.012	0.016	0.013	0.015	0.016	0.016	0.015
67)	cis-1,3-dichloropropene	0.345	0.373	0.371	0.349	0.386	0.357	0.387	0.392
		0.373	0.371	0.349	0.386	0.357	0.387	0.392	0.395
68)	4-methyl-2-pentanone								
		0.051	0.063	0.058	0.061	0.065	0.066	0.061	9.12
69)	3-methyl-1-butanol								
		0.004	0.003	0.004	0.004	0.004	0.005	0.005	0.004#
70)	toluene	1.224	1.057	0.959	0.956	1.041	0.985	1.028	1.032
		1.057	0.959	0.956	1.041	0.985	1.028	1.032	1.048
71)	trans-1,3-dichloropropene	0.339	0.309	0.317	0.303	0.351	0.325	0.349	0.354
		0.309	0.317	0.303	0.351	0.325	0.349	0.354	0.359
72)	ethyl methacrylate	0.161	0.200	0.177	0.215	0.209	0.235	0.244	0.249
		0.200	0.177	0.215	0.209	0.235	0.244	0.249	0.211
73)	1,1,2-trichloroethane	0.146	0.153	0.134	0.156	0.146	0.156	0.160	0.159
		0.153	0.134	0.156	0.146	0.156	0.160	0.159	0.151
74)	2-hexanone								
		0.043	0.055	0.050	0.053	0.057	0.059	0.053	11.29
75)	I chlorobenzene-d5								
		-----	-----	-----	-----	ISTD	-----	-----	
76)	toluene-d8 (s)	1.094	1.086	1.125	1.097	1.082	1.121	1.101	1.66
77)	tetrachloroethene								

6.7.4
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Initial Calibration Summary

Page 4 of 5

Job Number: JB39439

Sample: VI7473-ICC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I184954.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	0.307	0.339	0.337	0.347	0.359	0.348	0.357	0.364	0.377	0.348	5.70
78)	1,3-dichloropropane										
	0.290	0.354	0.371	0.328	0.355	0.341	0.347	0.357	0.361	0.345	6.94
79)	butyl acetate										
	0.096	0.118	0.111	0.117	0.124	0.129				0.116	10.03
80)	3,3-Dimethyl-1-Butanol										
	0.018	0.014	0.017	0.016	0.017	0.019	0.020			0.017	10.33
81)	dibromochloromethane										
	0.262	0.274	0.297	0.282	0.314	0.304	0.326	0.338	0.342	0.304	9.31
82)	1,2-dibromoethane										
	0.214	0.201	0.239	0.215	0.238	0.230	0.244	0.253	0.255	0.232	7.96
83)	chlorobenzene										
	0.730	0.818	0.783	0.753	0.815	0.792	0.821	0.834	0.843	0.799	4.72
84)	1,1,1,2-tetrachloroethane										
	0.276	0.317	0.301	0.279	0.313	0.308	0.317	0.327	0.325	0.307	5.99
85)	ethylbenzene										
	1.307	1.301	1.278	1.304	1.390	1.337	1.381	1.403	1.436	1.349	4.10
86)	m,p-xylene										
	0.510	0.495	0.495	0.496	0.538	0.524	0.531	0.542	0.552	0.520	4.22
87)	o-xylene										
	0.488	0.490	0.499	0.485	0.525	0.508	0.520	0.527	0.533	0.508	3.68
88)	styrene										
	0.710	0.737	0.735	0.814	0.809	0.861	0.886	0.908		0.808	9.24
89)	bromoform										
	0.192	0.194	0.182	0.206	0.196	0.216	0.230	0.238		0.207	9.49
90)	I 1,4-dichlorobenzene-d	-----	-----	-----	-----	-----	-----	-----	-----		
91)	4-bromofluorobenzene (s)										
	0.753	0.772	0.786	0.756	0.730	0.755				0.759	2.51
92)	isopropylbenzene										
	2.486	2.453	2.346	2.465	2.668	2.582	2.608	2.590	2.596	2.533	4.00
93)	cyclohexanone										
	0.013	0.014	0.012	0.011	0.013	0.015				0.013	9.99
94)	1,1,2,2-tetrachloroethane										
	0.551	0.538	0.568	0.489	0.562	0.525	0.530	0.535	0.535	0.537	4.29
95)	trans-1,4-dichloro-2-butene										
	0.152	0.150	0.117	0.136	0.130	0.135	0.140	0.146		0.138	8.29
96)	1,2,3-trichloropropane										
	0.122	0.139	0.124	0.143	0.137	0.136	0.137	0.138		0.134	5.54
97)	n-propylbenzene										
	2.740	2.955	2.787	2.839	3.064	2.967	2.989	3.006	3.033	2.931	3.91
98)	bromobenzene										
	0.716	0.726	0.659	0.748	0.728	0.727	0.728	0.731		0.720	3.68
99)	2-chlorotoluene										
	0.597	0.656	0.633	0.609	0.659	0.652	0.655	0.650	0.652	0.640	3.57
100)	4-chlorotoluene										
	2.044	1.735	1.775	1.843	1.928	1.859	1.891	1.900	1.919	1.877	4.80
101)	1,3,5-trimethylbenzene										
	2.147	2.306	2.047	2.119	2.304	2.263	2.291	2.267	2.295	2.226	4.33
102)	tert-butylbenzene										
	1.963	1.916	1.829	1.824	1.984	1.905	1.882	1.926	1.934	1.907	2.87
103)	pentachloroethane										
	0.426	0.413	0.435	0.457	0.490	0.489	0.488	0.492	0.494	0.465	7.00
104)	1,2,4-trimethylbenzene										
	2.354	2.375	2.097	2.166	2.319	2.284	2.302	2.307	2.306	2.279	3.93
105)	sec-butylbenzene										
	2.614	2.760	2.595	2.731	2.977	2.918	2.910	2.901	2.920	2.814	5.07
106)	p-isopropyltoluene										
	2.337	2.369	2.189	2.325	2.520	2.466	2.469	2.474	2.500	2.405	4.50
107)	benzyl chloride										

6.7.4
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Initial Calibration Summary

Job Number: JB39439

Sample: VI7473-ICC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I184954.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

108)	1,3-dichlorobenzene	1.129	1.034	1.162	1.005	1.099	1.161	1.230	1.117	7.00
		1.357	1.289	1.325	1.293	1.364	1.331	1.362	1.360	1.388
109)	1,4-dichlorobenzene	1.586	1.455	1.348	1.291	1.384	1.348	1.355	1.376	1.387
		1.392	1.341	2.52						
110)	1,2-dichlorobenzene	1.255	1.214	1.323	1.200	1.272	1.292	1.309	1.309	1.311
		1.276	1.276	3.50						
111)	n-butylbenzene	1.124	1.106	1.099	1.113	1.240	1.215	1.256	1.273	1.310
		1.193	6.89							
112)	hexachloroethane	0.477	0.418	0.496	0.493	0.512	0.509	0.522	0.531	0.495
		7.15								
113)	1,2-dibromo-3-chloropropane	0.107	0.138	0.100	0.120	0.115	0.118	0.123	0.124	0.118
		9.84								
114)	1,3,5-Trichlorobenzene	1.074	1.040	1.010	1.048	1.137	1.127	1.153	1.166	1.170
		1.103	5.48							
115)	1,2,4-trichlorobenzene	0.754	0.734	0.774	0.882	0.883	0.957	0.976	0.988	0.869
		11.85								
116)	hexachlorobutadiene	0.654	0.610	0.605	0.643	0.660	0.657	0.679	0.671	0.676
		0.651	4.14							
117)	naphthalene	1.345	1.457	1.324	1.506	1.639	1.697	1.751	1.740	1.557
		11.10								
118)	1,2,3-trichlorobenzene	0.646	0.678	0.674	0.744	0.777	0.830	0.850	0.843	0.755
		10.90								

(#) = Out of Range ### Number of calibration levels exceeded format ###

MI7473.M

Fri Jun 28 17:03:37 2013 RPT1

Initial Calibration Verification

Page 1 of 3

Job Number: JB39439

Sample: VI7473-ICV7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I184956.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\VI7473\I184956.D Vial: 32
Acq On : 7 Jun 2013 8:46 pm Operator: SCOTTM
Sample : ICV7473-50 Inst : MSI
Misc : MS49112,VI7473,,,,,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\MI7473.M (RTE Integrator)
Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
Last Update : Fri Jun 28 12:42:55 2013
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	97	0.00	7.19
2	tertiary butyl alcohol	1.029	1.074	-4.4	102	0.00	7.31
3	iso-butyl alcohol	0.229	0.250	-9.2	106	0.00	9.97
4	1,4-dioxane	0.084	0.087	-3.6	93	0.00	11.08
5	I pentafluorobenzene	1.000	1.000	0.0	101	0.00	9.43
6	chlorodifluoromethane	0.309	0.287	7.1	98	0.01	3.78
7	dichlorodifluoromethane	50.000	45.970	True Calc.	% Drift	8.1	92 0.01 3.75
8	chloromethane	0.402	0.380	AvgRF CCRF	% Dev	5.5	95 0.00 4.11
9	vinyl chloride	50.000	46.531	True Calc.	% Drift	6.9	94 0.00 4.35
10	bromomethane	0.295	0.278	AvgRF CCRF	% Dev	5.8	95 0.01 4.99
11	chloroethane	0.166	0.167	0.166	-0.6	93	0.00 5.17
12	trichlorofluoromethane	50.000	47.223	True Calc.	% Drift	5.6	94 0.01 5.63
13	ethyl ether	0.155	0.146	AvgRF CCRF	% Dev	5.8	103 0.00 6.07
14	acrolein	0.042	0.040	0.042	4.8	98	0.00 6.30
15	freon 113	0.246	0.236	0.246	4.1	93	0.00 6.45
16	1,1-dichloroethene	0.468	0.453	0.468	3.2	98	0.00 6.47
17	acetone	0.018	0.018	0.018	0.0	107	0.00 6.53
18	iodomethane	0.624	0.633	0.624	-1.4	100	0.00 6.75
19	carbon disulfide	1.096	1.066	1.096	2.7	98	0.00 6.87
20	methyl acetate	0.036	0.037	0.036	-2.8	110	-0.01 7.00
21	allyl chloride	0.171	0.168	0.171	1.8	99	0.00 7.01
22	acetonitrile	500.000	476.063	True Calc.	% Drift	4.8	102 0.00 7.01
23	methylene chloride	0.350	0.328	AvgRF CCRF	% Dev	6.3	100 0.00 7.20
24	methyl tert butyl ether	0.931	0.876	0.931	6.0	98	0.00 7.55
25	acrylonitrile	0.070	0.071	0.070	-1.4	101	0.00 7.53

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Initial Calibration Verification

Job Number: JB39439

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VI7473-ICV7473

Lab FileID: I184956.D

26	trans-1,2-dichloroethene	0.346	0.325	6.1	99	0.00	7.58
27	hexane	0.362	0.344	5.0	104	0.00	7.91
28	di-isopropyl ether	0.853	0.850	0.4	101	0.00	8.16
29	vinyl acetate	0.179	0.174	2.8	101	0.00	8.15
30	1,1-dichloroethane	0.541	0.539	0.4	101	0.00	8.16
31	chloroprene	0.436	0.437	-0.3	99	0.00	8.27
32	ethyl tert-butyl ether	0.959	0.951	0.8	98	0.00	8.63
33	2-butanone	0.027	0.027	0.0	101	-0.01	8.87
34	ethyl acetate	0.027	0.027	0.0	101	0.00	8.91
35	2,2-dichloropropane	0.543	0.513	5.5	97	0.00	8.91
36	cis-1,2-dichloroethene	0.375	0.356	5.1	100	0.00	8.90
37	methacrylonitrile	0.091	0.093	-2.2	105	0.00	9.15
38	propionitrile	0.028	0.028	0.0	101	0.00	8.96
39	bromochloromethane	0.173	0.175	-1.2	101	0.00	9.21
40	tetrahydrofuran	0.069	0.063	8.7	97	0.01	9.26
41	chloroform	0.631	0.609	3.5	101	0.00	9.28
42	tert-Butyl Formate	0.236	0.208	11.9	86	0.00	9.31
43 S	dibromofluoromethane (s)	0.350	0.341	2.6	100	0.00	9.47
44	1,1,1-trichloroethane	0.564	0.570	-1.1	99	0.00	9.53
45	cyclohexane	0.453	0.451	0.4	98	0.00	9.61
46 I	1,4-difluorobenzene	1.000	1.000	0.0	101	0.00	10.36
47 s	1,2-dichloroethane-d4 (s)	0.271	0.268	1.1	101	0.00	9.89
48	carbon tetrachloride	0.376	0.385	-2.4	100	0.00	9.74
49	1,1-dichloropropene	0.316	0.317	-0.3	99	0.00	9.71
50	isopropyl acetate	0.069	0.071	-2.9	100	0.00	9.91
51	benzene	0.939	0.928	1.2	99	0.00	9.97
52	2,2,4-trimethylpentane	0.780	0.698	10.5	87	0.00	9.99
53	tert-amyl methyl ether	0.668	0.681	-1.9	101	0.00	10.02
54	1,2-dichloroethane	0.317	0.318	-0.3	101	0.00	9.98
55	heptane	0.158	0.140	11.4	91	0.00	10.17
56	n-butyl alcohol	0.004	0.004#	0.0	99	0.00	10.49
57	trichloroethene	0.243	0.253	-4.1	100	0.00	10.70
58	ethyl acrylate	0.297	0.293	1.3	97	0.00	10.92
59	methyl methacrylate	0.117	0.117	0.0	98	0.00	10.98
60	1,2-dichloropropane	0.212	0.215	-1.4	100	0.00	10.96
61	methylcyclohexane	0.369	0.382	-3.5	99	0.00	10.93
62	dibromomethane	0.142	0.142	0.0	99	0.00	11.12
63	bromodichloromethane	0.324	0.340	-4.9	100	0.00	11.25
64	2-nitropropane	0.068	0.053	22.1#	79	0.00	11.46
65	2-chloroethyl vinyl ether	0.081	0.080	1.2	95	0.00	11.50
66	epichlorohydrin	0.015	0.015	0.0	104	0.00	11.62
67	cis-1,3-dichloropropene	0.373	0.380	-1.9	99	0.00	11.72
68	4-methyl-2-pentanone	0.061	0.061	0.0	101	0.00	11.81
69	3-methyl-1-butanol	0.004	0.004#	0.0	96	0.00	11.84
70	toluene	1.037	0.999	3.7	98	0.00	12.08
71	trans-1,3-dichloropropene	0.334	0.341	-2.1	99	0.00	12.28
72	ethyl methacrylate	0.211	0.231	-9.5	100	0.00	12.29
73	1,1,2-trichloroethane	0.151	0.153	-1.3	99	0.00	12.49
74	2-hexanone	0.053	0.055	-3.8	103	0.00	12.67
75 I	chlorobenzene-d5	1.000	1.000	0.0	99	0.00	13.52
76 S	toluene-d8 (s)	1.101	1.084	1.5	98	0.00	12.01
77	tetrachloroethene	0.348	0.352	-1.1	98	0.00	12.67
78	1,3-dichloropropane	0.345	0.351	-1.7	100	0.00	12.67
79	butyl acetate	0.116	0.123	-6.0	104	0.00	12.75
80	3,3-Dimethyl-1-Butanol	0.017	0.016	5.9	91	0.00	12.84
81	dibromochloromethane	0.304	0.328	-7.9	100	0.00	12.94
82	1,2-dibromoethane	0.232	0.245	-5.6	100	0.00	13.09
83	chlorobenzene	0.799	0.806	-0.9	97	0.00	13.56

Initial Calibration Verification

Job Number: JB39439

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VI7473-ICV7473

Lab FileID: I184956.D

84	1,1,1,2-tetrachloroethane	0.307	0.316	-2.9	99	0.00	13.61
85	ethylbenzene	1.349	1.367	-1.3	98	0.00	13.61
86	m,p-xylene	0.520	0.527	-1.3	98	0.00	13.72
87	o-xylene	0.508	0.519	-2.2	99	0.00	14.14
88	styrene	0.808	0.853	-5.6	98	0.00	14.15
89	bromoform	0.207	0.220	-6.3	101	0.00	14.41
90	I 1,4-dichlorobenzene-d4	1.000	1.000	0.0	101	0.00	15.88
91	S 4-bromofluorobenzene (s)	0.759	0.726	4.3	97	0.00	14.69
92	isopropylbenzene	2.533	2.521	0.5	98	0.00	14.48
93	cyclohexanone	0.013	0.012	7.7	104	0.00	14.64
94	1,1,2,2-tetrachloroethane	0.537	0.524	2.4	100	0.00	14.79
95	trans-1,4-dichloro-2-bute	0.138	0.135	2.2	101	0.00	14.83
96	1,2,3-trichloropropane	0.134	0.133	0.7	99	0.00	14.86
97	n-propylbenzene	2.931	2.895	1.2	98	0.00	14.90
98	bromobenzene	0.720	0.720	0.0	100	0.00	14.88
99	2-chlorotoluene	0.640	0.632	1.3	97	0.00	15.04
100	4-chlorotoluene	1.877	1.844	1.8	98	0.00	15.15
101	1,3,5-trimethylbenzene	2.226	2.214	0.5	98	0.00	15.05
102	tert-butylbenzene	1.907	1.884	1.2	101	0.00	15.41
103	pentachloroethane	0.465	0.484	-4.1	100	0.00	15.49
104	1,2,4-trimethylbenzene	2.279	2.222	2.5	97	0.00	15.46
105	sec-butylbenzene	2.814	2.817	-0.1	98	0.00	15.63
106	p-isopropyltoluene	2.405	2.413	-0.3	99	0.00	15.76
107	benzyl chloride	1.117	1.096	1.9	101	0.00	16.03
108	1,3-dichlorobenzene	1.341	1.318	1.7	98	0.00	15.83
109	1,4-dichlorobenzene	1.392	1.334	4.2	99	0.00	15.91
110	1,2-dichlorobenzene	1.276	1.282	-0.5	99	0.00	16.32
111	n-butylbenzene	1.193	1.205	-1.0	97	0.00	16.20
112	hexachloroethane	0.495	0.500	-1.0	99	0.00	16.60
113	1,2-dibromo-3-chloropropa	0.118	0.119	-0.8	102	0.00	17.14
114	1,3,5-Trichlorobenzene	1.103	1.101	0.2	96	0.00	17.34
115	1,2,4-trichlorobenzene	0.869	0.919	-5.8	97	0.00	18.01
116	hexachlorobutadiene	0.651	0.658	-1.1	98	0.00	18.13
117	naphthalene	1.557	1.682	-8.0	100	0.00	18.29
118	1,2,3-trichlorobenzene	0.755	0.817	-8.2	99	0.00	18.55

(#) = Out of Range
I184954.D MI7473.MSPCC's out = 0 CCC's out = 0
Mon Jul 01 10:49:14 2013 RPT16.7.5
6

Continuing Calibration Summary

Page 1 of 3

Job Number: JB39439

Sample: VI7479-CC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I185122.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\VI7479\I185122.D Vial: 3
 Acq On : 14 Jun 2013 10:49 am Operator: SCOTTM
 Sample : CC7473-50 Inst : MSI
 Misc : MS49848,VI7479,,,,,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\MI7473.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Wed Jun 12 11:48:54 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	156	0.00
2	tertiary butyl alcohol	0.103	0.101	1.9	156	0.00
3	iso-butyl alcohol	0.023	0.022	4.3	151	0.00
4	1,4-dioxane	0.008	0.008#	0.0	143	0.00
5	I pentafluorobenzene	1.000	1.000	0.0	125	0.00
6	chlorodifluoromethane	0.309	0.328	-6.1	138	0.00
7	dichlorodifluoromethane	50.000	48.475	3.0	120	0.00
8	chloromethane	0.402	0.433	-7.7	133	0.00
9	vinyl chloride	50.000	52.873	-5.7	131	0.00
10	bromomethane	0.295	0.294	0.3	123	0.00
11	chloroethane	0.166	0.187	-12.7	128	0.00
12	trichlorofluoromethane	50.000	50.075	-0.2	123	0.00
13	ethyl ether	0.155	0.155	0.0	135	0.00
14	acrolein	0.042	0.050	-19.0	151	-0.01
15	freon 113	0.246	0.269	-9.3	130	0.00
16	1,1-dichloroethene	0.468	0.501	-7.1	134	0.00
17	acetone	0.018	0.019	-5.6	139	0.00
18	iodomethane	0.624	0.662	-6.1	128	0.00
19	carbon disulfide	1.096	1.159	-5.7	132	0.00
20	methyl acetate	0.036	0.041	-13.9	149	-0.02
21	allyl chloride	0.171	0.179	-4.7	130	0.00
22	acetonitrile	500.000	535.243	-7.0	142	0.00
23	methylene chloride	0.350	0.351	-0.3	132	0.00
24	methyl tert butyl ether	0.931	0.980	-5.3	135	0.00
25	acrylonitrile	0.070	0.083	-18.6	145	0.00

6.7.6
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Continuing Calibration Summary

Page 2 of 3

Job Number: JB39439

Sample: VI7479-CC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I185122.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

26	trans-1,2-dichloroethene	0.346	0.347	-0.3	131	0.00	7.58
27	hexane	0.362	0.361	0.3	135	0.00	7.90
28	di-isopropyl ether	0.853	0.950	-11.4	139	0.00	8.15
29	vinyl acetate	0.179	0.191	-6.7	136	0.00	8.15
30	1,1-dichloroethane	0.541	0.586	-8.3	135	0.00	8.15
31	chloroprene	0.436	0.484	-11.0	135	0.00	8.26
32	ethyl tert-butyl ether	0.959	1.069	-11.5	136	0.00	8.62
33	2-butanone	0.027	0.032	-18.5	149	-0.02	8.86
34	ethyl acetate	0.027	0.032	-18.5	146	-0.01	8.90
35	2,2-dichloropropane	0.543	0.555	-2.2	130	0.00	8.90
36	cis-1,2-dichloroethene	0.375	0.376	-0.3	130	0.00	8.90
37	methacrylonitrile	0.091	0.105	-15.4	145	-0.01	9.14
38	propionitrile	0.028	0.034	-21.4#	149	-0.01	8.95
39	bromochloromethane	0.173	0.184	-6.4	130	0.00	9.21
40	tetrahydrofuran	0.069	0.082	-18.8	155	0.00	9.25
41	chloroform	0.631	0.647	-2.5	132	0.00	9.27
42	tert-Butyl Formate	0.236	0.276	-16.9	141	-0.01	9.30
43 S	dibromofluoromethane (s)	0.350	0.348	0.6	126	0.00	9.47
44	1,1,1-trichloroethane	0.564	0.606	-7.4	130	0.00	9.53
45	cyclohexane	0.453	0.487	-7.5	131	0.00	9.60
46 I	1,4-difluorobenzene	1.000	1.000	0.0	126	0.00	10.35
47 s	1,2-dichloroethane-d4 (s)	0.271	0.262	3.3	123	0.00	9.89
48	carbon tetrachloride	0.376	0.405	-7.7	131	0.00	9.73
49	1,1-dichloropropene	0.316	0.340	-7.6	132	0.00	9.71
50	isopropyl acetate	0.069	0.078	-13.0	135	0.00	9.91
51	benzene	0.939	0.992	-5.6	132	0.00	9.97
52	2,2,4-trimethylpentane	0.780	0.892	-14.4	139	0.00	9.99
53	tert-amyl methyl ether	0.668	0.736	-10.2	136	0.00	10.02
54	1,2-dichloroethane	0.317	0.336	-6.0	132	0.00	9.98
55	heptane	0.158	0.166	-5.1	135	0.00	10.16
56	n-butyl alcohol	0.004	0.006#	-50.0#	153	-0.01	10.48
57	trichloroethene	0.243	0.262	-7.8	128	0.00	10.70
58	ethyl acrylate	0.297	0.333	-12.1	137	0.00	10.92
59	methyl methacrylate	0.117	0.130	-11.1	136	0.00	10.97
60	1,2-dichloropropane	0.212	0.229	-8.0	132	0.00	10.96
61	methylcyclohexane	0.369	0.409	-10.8	131	0.00	10.92
62	dibromomethane	0.142	0.151	-6.3	131	0.00	11.11
63	bromodichloromethane	0.324	0.359	-10.8	131	0.00	11.25
64	2-nitropropane	0.068	0.074	-8.8	137	0.00	11.46
65	2-chloroethyl vinyl ether	0.081	0.090	-11.1	135	0.00	11.50
66	epichlorohydrin	0.015	0.018	-20.0	151	0.00	11.61
67	cis-1,3-dichloropropene	0.373	0.397	-6.4	129	0.00	11.71
68	4-methyl-2-pentanone	0.061	0.071	-16.4	146	0.00	11.81
69	3-methyl-1-butanol	0.004	0.005#	-25.0#	148	0.00	11.84
70	toluene	1.037	1.038	-0.1	127	0.00	12.08
71	trans-1,3-dichloropropene	0.334	0.361	-8.1	130	0.00	12.27
72	ethyl methacrylate	0.211	0.252	-19.4	135	0.00	12.28
73	1,1,2-trichloroethane	0.151	0.164	-8.6	132	0.00	12.49
74	2-hexanone	0.053	0.063	-18.9	149	0.00	12.67
75 I	chlorobenzene-d5	1.000	1.000	0.0	121	0.00	13.52
76 S	toluene-d8 (s)	1.101	1.136	-3.2	126	0.00	12.01
77	tetrachloroethene	0.348	0.370	-6.3	126	0.00	12.67
78	1,3-dichloropropane	0.345	0.380	-10.1	133	0.00	12.67
79	butyl acetate	0.116	0.137	-18.1	142	0.00	12.75
80	3,3-Dimethyl-1-Butanol	0.017	0.022	-29.4#	155	0.00	12.84
81	dibromochloromethane	0.304	0.345	-13.5	128	0.00	12.93
82	1,2-dibromoethane	0.232	0.262	-12.9	131	0.00	13.08
83	chlorobenzene	0.799	0.842	-5.4	124	0.00	13.55

6.7.6
6

Continuing Calibration Summary

Page 3 of 3

Job Number: JB39439

Sample: VI7479-CC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I185122.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

84	1,1,1,2-tetrachloroethane	0.307	0.327	-6.5	125	0.00	13.61
85	ethylbenzene	1.349	1.412	-4.7	124	0.00	13.61
86	m,p-xylene	0.520	0.552	-6.2	126	0.00	13.72
87	o-xylene	0.508	0.539	-6.1	126	0.00	14.14
88	styrene	0.808	0.886	-9.7	125	0.00	14.15
89	bromoform	0.207	0.234	-13.0	132	0.00	14.40
90 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	125	0.00	15.88
91 S	4-bromofluorobenzene (s)	0.759	0.734	3.3	121	0.00	14.68
92	isopropylbenzene	2.533	2.587	-2.1	124	0.00	14.48
93	cyclohexanone	0.013	0.016	-23.1#	171	0.00	14.64
94	1,1,2,2-tetrachloroethane	0.537	0.580	-8.0	137	0.00	14.79
95	trans-1,4-dichloro-2-bute	0.138	0.154	-11.6	143	0.00	14.83
96	1,2,3-trichloropropane	0.134	0.149	-11.2	137	0.00	14.86
97	n-propylbenzene	2.931	2.959	-1.0	124	0.00	14.89
98	bromobenzene	0.720	0.735	-2.1	126	0.00	14.87
99	2-chlorotoluene	0.640	0.653	-2.0	125	0.00	15.04
100	4-chlorotoluene	1.877	1.877	0.0	124	0.00	15.14
101	1,3,5-trimethylbenzene	2.226	2.233	-0.3	122	0.00	15.05
102	tert-butylbenzene	1.907	1.884	1.2	125	0.00	15.41
103	pentachloroethane	0.465	0.488	-4.9	125	0.00	15.49
104	1,2,4-trimethylbenzene	2.279	2.254	1.1	122	0.00	15.45
105	sec-butylbenzene	2.814	2.888	-2.6	124	0.00	15.63
106	p-isopropyltoluene	2.405	2.418	-0.5	122	0.00	15.76
107	benzyl chloride	1.117	1.212	-8.5	138	0.00	16.03
108	1,3-dichlorobenzene	1.341	1.341	0.0	123	0.00	15.82
109	1,4-dichlorobenzene	1.392	1.362	2.2	126	0.00	15.91
110	1,2-dichlorobenzene	1.276	1.294	-1.4	124	0.00	16.32
111	n-butylbenzene	1.193	1.240	-3.9	123	0.00	16.20
112	hexachloroethane	0.495	0.509	-2.8	125	0.00	16.60
113	1,2-dibromo-3-chloropropene	0.118	0.132	-11.9	140	0.00	17.14
114	1,3,5-Trichlorobenzene	1.103	1.143	-3.6	124	0.00	17.34
115	1,2,4-trichlorobenzene	0.869	0.944	-8.6	123	0.00	18.00
116	hexachlorobutadiene	0.651	0.659	-1.2	121	0.00	18.13
117	naphthalene	1.557	1.796	-15.4	132	0.00	18.28
118	1,2,3-trichlorobenzene	0.755	0.840	-11.3	126	0.00	18.54

(#) = Out of Range
I184954.D MI7473.M

SPCC's out = 0 CCC's out = 0
Mon Jun 17 08:26:11 2013 RPT1

6.7.6
6

Continuing Calibration Summary

Page 1 of 3

Job Number: JB39439

Sample: VI7481-CC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I185178.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\VI7481\I185178.D Vial: 1
 Acq On : 17 Jun 2013 10:41 am Operator: SCOTTM
 Sample : CC7473-50 Inst : MSI
 Misc : MS49975,VI7481,,,,,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\MI7473.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Wed Jun 12 11:48:54 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	139	0.00	7.18
2	tertiary butyl alcohol	0.103	0.103	0.0	141	0.00	7.30
3	iso-butyl alcohol	0.023	0.033	-43.5#	201#	0.00	9.97
4	1,4-dioxane	0.008	0.009#	-12.5	132	0.00	11.07
5	I pentafluorobenzene	1.000	1.000	0.0	122	0.00	9.43
6	chlorodifluoromethane	0.309	0.332	-7.4	137	0.00	3.77
7	dichlorodifluoromethane	50.000	54.673	True Calc.	% Drift	-----	3.75
8	chloromethane	0.402	0.479	AvgRF	CCRF	% Dev	-----
9	vinyl chloride	50.000	56.323	True	Calc.	% Drift	-----
10	bromomethane	0.295	0.311	AvgRF	CCRF	% Dev	-----
11	chloroethane	0.166	0.194	0.295	0.311	-5.4	4.98
12	trichlorofluoromethane	50.000	51.082	True	Calc.	% Drift	-----
13	ethyl ether	0.155	0.156	AvgRF	CCRF	% Dev	-----
14	acrolein	0.042	0.047	0.155	0.156	-0.6	6.06
15	freon 113	0.246	0.255	0.042	0.047	-11.9	6.30
16	1,1-dichloroethene	0.468	0.492	0.246	0.255	-3.7	6.45
17	acetone	0.018	0.022	0.468	0.492	-5.1	6.47
18	iodomethane	0.624	0.658	0.018	0.022	-19.9	6.52
19	carbon disulfide	1.096	1.133	0.624	0.658	-5.4	6.74
20	methyl acetate	0.036	0.039	1.096	1.133	-3.4	6.87
21	allyl chloride	0.171	0.179	0.036	0.039	126	7.00
22	acetonitrile	500.000	526.858	True	Calc.	% Drift	-----
23	methylene chloride	0.350	0.347	AvgRF	CCRF	% Dev	-----
24	methyl tert butyl ether	0.931	0.945	0.350	0.347	-1.5	7.19
25	acrylonitrile	0.070	0.080	0.931	0.945	-14.3	7.54

Continuing Calibration Summary

Page 2 of 3

Job Number: JB39439

Sample: VI7481-CC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I185178.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

26	trans-1,2-dichloroethene	0.346	0.343	0.9	127	0.00	7.58
27	hexane	0.362	0.344	5.0	126	0.00	7.90
28	di-isopropyl ether	0.853	0.915	-7.3	131	0.00	8.15
29	vinyl acetate	0.179	0.189	-5.6	133	0.00	8.15
30	1,1-dichloroethane	0.541	0.584	-7.9	132	0.00	8.15
31	chloroprene	0.436	0.471	-8.0	129	0.00	8.26
32	ethyl tert-butyl ether	0.959	1.045	-9.0	130	0.00	8.62
33	2-butanone	0.027	0.029	-7.4	133	-0.02	8.86
34	ethyl acetate	0.027	0.030	-11.1	135	-0.02	8.89
35	2,2-dichloropropane	0.543	0.556	-2.4	127	0.00	8.90
36	cis-1,2-dichloroethene	0.375	0.377	-0.5	128	0.00	8.90
37	methacrylonitrile	0.091	0.101	-11.0	137	-0.01	9.14
38	propionitrile	0.028	0.032	-14.3	138	-0.01	8.95
39	bromochloromethane	0.173	0.185	-6.9	128	0.00	9.21
40	tetrahydrofuran	0.069	0.077	-11.6	142	0.00	9.25
41	chloroform	0.631	0.644	-2.1	129	0.00	9.27
42	tert-Butyl Formate	0.236	0.264	-11.9	132	0.00	9.31
43 S	dibromofluoromethane (s)	0.350	0.348	0.6	124	0.00	9.47
44	1,1,1-trichloroethane	0.564	0.597	-5.9	126	0.00	9.52
45	cyclohexane	0.453	0.479	-5.7	126	0.00	9.60
46 I	1,4-difluorobenzene	1.000	1.000	0.0	125	0.00	10.35
47 s	1,2-dichloroethane-d4 (s)	0.271	0.255	5.9	120	0.00	9.89
48	carbon tetrachloride	0.376	0.388	-3.2	125	0.00	9.74
49	1,1-dichloropropene	0.316	0.332	-5.1	129	0.00	9.71
50	isopropyl acetate	0.069	0.075	-8.7	131	0.00	9.91
51	benzene	0.939	0.960	-2.2	128	0.00	9.97
52	2,2,4-trimethylpentane	0.780	0.825	-5.8	128	0.00	9.98
53	tert-amyl methyl ether	0.668	0.701	-4.9	129	0.00	10.02
54	1,2-dichloroethane	0.317	0.327	-3.2	128	0.00	9.98
55	heptane	0.158	0.158	0.0	128	0.00	10.16
56	n-butyl alcohol	0.004	0.005#	-25.0#	140	0.00	10.49
57	trichloroethene	0.243	0.257	-5.8	126	0.00	10.70
58	ethyl acrylate	0.297	0.309	-4.0	127	0.00	10.92
59	methyl methacrylate	0.117	0.128	-9.4	134	0.00	10.97
60	1,2-dichloropropane	0.212	0.223	-5.2	128	0.00	10.96
61	methylcyclohexane	0.369	0.385	-4.3	123	0.00	10.92
62	dibromomethane	0.142	0.146	-2.8	126	0.00	11.11
63	bromodichloromethane	0.324	0.351	-8.3	128	0.00	11.25
64	2-nitropropane	0.068	0.071	-4.4	131	0.00	11.46
65	2-chloroethyl vinyl ether	0.081	0.082	-1.2	123	0.00	11.50
66	epichlorohydrin	0.015	0.017	-13.3	140	0.00	11.61
67	cis-1,3-dichloropropene	0.373	0.391	-4.8	127	0.00	11.71
68	4-methyl-2-pentanone	0.061	0.066	-8.2	136	0.00	11.81
69	3-methyl-1-butanol	0.004	0.005#	-25.0#	138	0.00	11.84
70	toluene	1.037	1.035	0.2	126	0.00	12.08
71	trans-1,3-dichloropropene	0.334	0.353	-5.7	127	0.00	12.27
72	ethyl methacrylate	0.211	0.247	-17.1	132	0.00	12.28
73	1,1,2-trichloroethane	0.151	0.160	-6.0	128	0.00	12.49
74	2-hexanone	0.053	0.059	-11.3	139	0.00	12.67
75 I	chlorobenzene-d5	1.000	1.000	0.0	124	0.00	13.52
76 S	toluene-d8 (s)	1.101	1.123	-2.0	127	0.00	12.01
77	tetrachloroethene	0.348	0.361	-3.7	126	0.00	12.67
78	1,3-dichloropropane	0.345	0.361	-4.6	129	0.00	12.67
79	butyl acetate	0.116	0.128	-10.3	136	0.00	12.75
80	3,3-Dimethyl-1-Butanol	0.017	0.019	-11.8	136	0.00	12.84
81	dibromochloromethane	0.304	0.329	-8.2	126	0.00	12.94
82	1,2-dibromoethane	0.232	0.251	-8.2	128	0.00	13.08
83	chlorobenzene	0.799	0.821	-2.8	124	0.00	13.55

6.7.7
6

Continuing Calibration Summary

Page 3 of 3

Job Number: JB39439

Sample: VI7481-CC7473

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: I185178.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

84	1,1,1,2-tetrachloroethane	0.307	0.315	-2.6	123	0.00	13.61
85	ethylbenzene	1.349	1.379	-2.2	124	0.00	13.61
86	m,p-xylene	0.520	0.537	-3.3	126	0.00	13.72
87	o-xylene	0.508	0.528	-3.9	126	0.00	14.14
88	styrene	0.808	0.852	-5.4	123	0.00	14.15
89	bromoform	0.207	0.223	-7.7	128	0.00	14.40
90 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	123	0.00	15.88
91 S	4-bromofluorobenzene (s)	0.759	0.743	2.1	121	0.00	14.68
92	isopropylbenzene	2.533	2.604	-2.8	123	0.00	14.48
93	cyclohexanone	0.013	0.018	-38.5#	197	0.00	14.63
94	1,1,2,2-tetrachloroethane	0.537	0.556	-3.5	130	0.00	14.79
95	trans-1,4-dichloro-2-bute	0.138	0.146	-5.8	134	0.00	14.83
96	1,2,3-trichloropropane	0.134	0.141	-5.2	128	0.00	14.86
97	n-propylbenzene	2.931	2.996	-2.2	124	0.00	14.90
98	bromobenzene	0.720	0.733	-1.8	124	0.00	14.87
99	2-chlorotoluene	0.640	0.657	-2.7	124	0.00	15.04
100	4-chlorotoluene	1.877	1.892	-0.8	124	0.00	15.14
101	1,3,5-trimethylbenzene	2.226	2.264	-1.7	122	0.00	15.05
102	tert-butylbenzene	1.907	1.876	1.6	123	0.00	15.41
103	pentachloroethane	0.465	0.476	-2.4	120	0.00	15.49
104	1,2,4-trimethylbenzene	2.279	2.269	0.4	122	0.00	15.45
105	sec-butylbenzene	2.814	2.885	-2.5	122	0.00	15.63
106	p-isopropyltoluene	2.405	2.410	-0.2	120	0.00	15.76
107	benzyl chloride	1.117	1.184	-6.0	133	0.00	16.03
108	1,3-dichlorobenzene	1.341	1.360	-1.4	123	0.00	15.82
109	1,4-dichlorobenzene	1.392	1.363	2.1	124	0.00	15.91
110	1,2-dichlorobenzene	1.276	1.296	-1.6	122	0.00	16.32
111	n-butylbenzene	1.193	1.240	-3.9	122	0.00	16.19
112	hexachloroethane	0.495	0.514	-3.8	125	0.00	16.60
113	1,2-dibromo-3-chloropropene	0.118	0.125	-5.9	131	-0.01	17.13
114	1,3,5-Trichlorobenzene	1.103	1.132	-2.6	121	0.00	17.34
115	1,2,4-trichlorobenzene	0.869	0.934	-7.5	120	0.00	18.00
116	hexachlorobutadiene	0.651	0.643	1.2	117	0.00	18.13
117	naphthalene	1.557	1.719	-10.4	125	0.00	18.28
118	1,2,3-trichlorobenzene	0.755	0.825	-9.3	123	0.00	18.54

(#) = Out of Range
I184954.D MI7473.M

SPCC's out = 0 CCC's out = 0
Mon Jun 17 15:27:31 2013 RPT1

6.7.7
6



GC/MS Volatiles

Raw Data

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7479\
 Data File : I185133.D
 Acq On : 14 Jun 2013 5:15 pm
 Operator : SCOTTM
 Sample : JB39439-1,VSL
 Misc : MS49933,VI7479,5.8,,,1
 ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jun 17 09:04:44 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.180	65	96003	50.00	ug/L	0.00
5) pentafluorobenzene	9.434	168	326400	50.00	ug/L	0.00
46) 1,4-difluorobenzene	10.350	114	457219	50.00	ug/L	0.00
75) chlorobenzene-d5	13.519	117	360413	50.00	ug/L	0.00
90) 1,4-dichlorobenzene-d4	15.883	152	181249	50.00	ug/L	0.00

System Monitoring Compounds

43) dibromofluoromethane (s)	9.471	113	116818	51.18	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	102.36%
47) 1,2-dichloroethane-d4...	9.890	65	128508	51.85	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	103.70%
76) toluene-d8 (s)	12.008	98	408785	51.52	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	103.04%
91) 4-bromofluorobenzene (s)	14.680	95	139928	50.87	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	101.74%

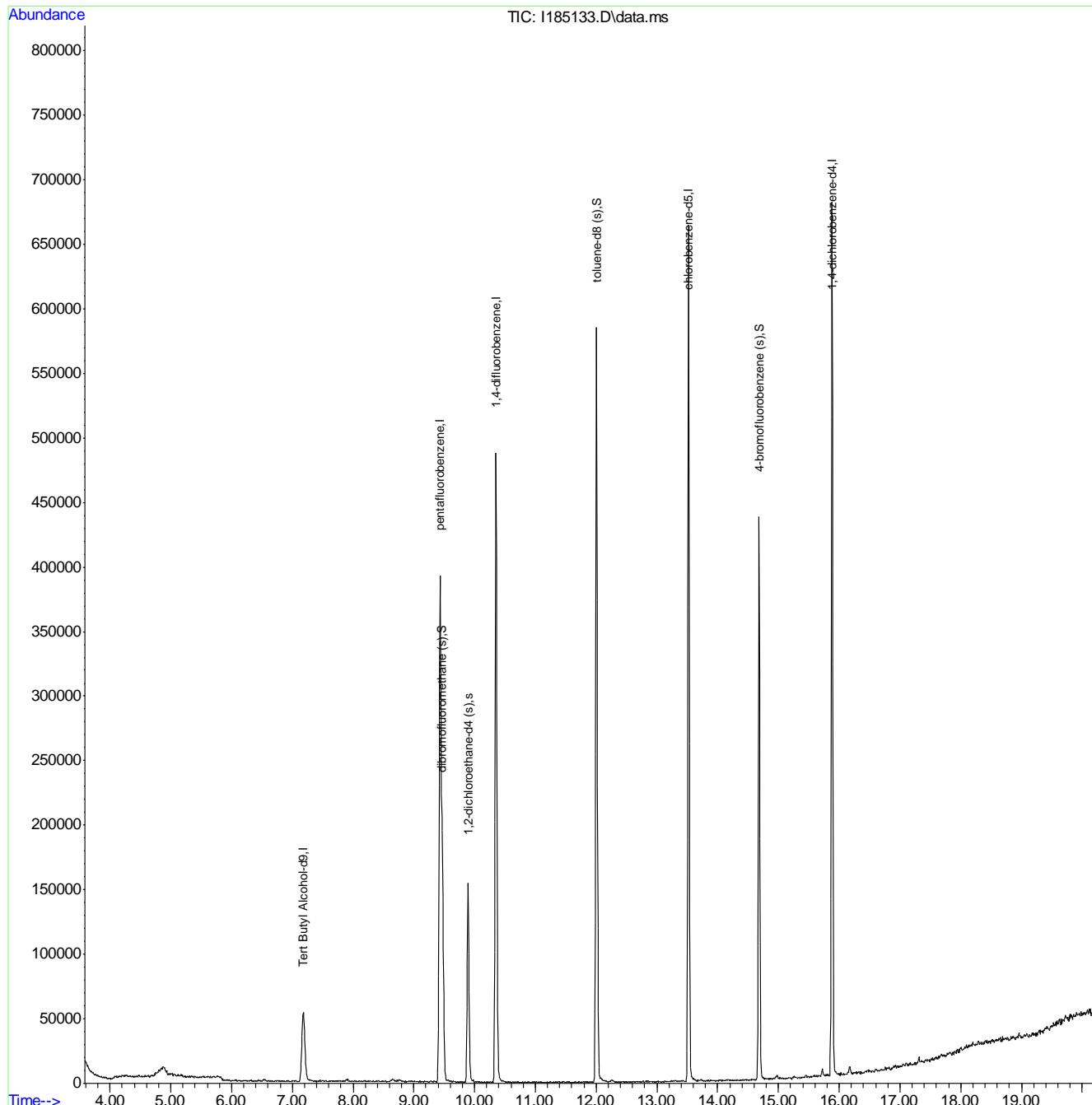
Target Compounds	Qvalue
(#)	= qualifier out of range (m) = manual integration (+) = signals summed

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7479\
 Data File : I185133.D
 Acq On : 14 Jun 2013 5:15 pm
 Operator : SCOTTM
 Sample : JB39439-1, VSL
 Misc : MS49933, VI7479, 5.8,,,,1
 ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jun 17 09:04:44 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7481\
 Data File : I185194.D
 Acq On : 17 Jun 2013 6:52 pm
 Operator : SCOTTM
 Sample : JB39439-2,VSL
 Misc : MS49933,VI7481,6.3,,,1
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Jun 18 09:21:54 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.170	65	128962	50.00	ug/L	-0.01
5) pentafluorobenzene	9.435	168	318364	50.00	ug/L	0.00
46) 1,4-difluorobenzene	10.355	114	445058	50.00	ug/L	0.00
75) chlorobenzene-d5	13.520	117	360356	50.00	ug/L	0.00
90) 1,4-dichlorobenzene-d4	15.884	152	174573	50.00	ug/L	0.00

System Monitoring Compounds

43) dibromofluoromethane (s)	9.471	113	115205	51.75	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	103.50%
47) 1,2-dichloroethane-d4...	9.895	65	125374	51.97	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	103.94%
76) toluene-d8 (s)	12.008	98	405517	51.12	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	102.24%
91) 4-bromofluorobenzene (s)	14.681	95	136929	51.68	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	103.36%

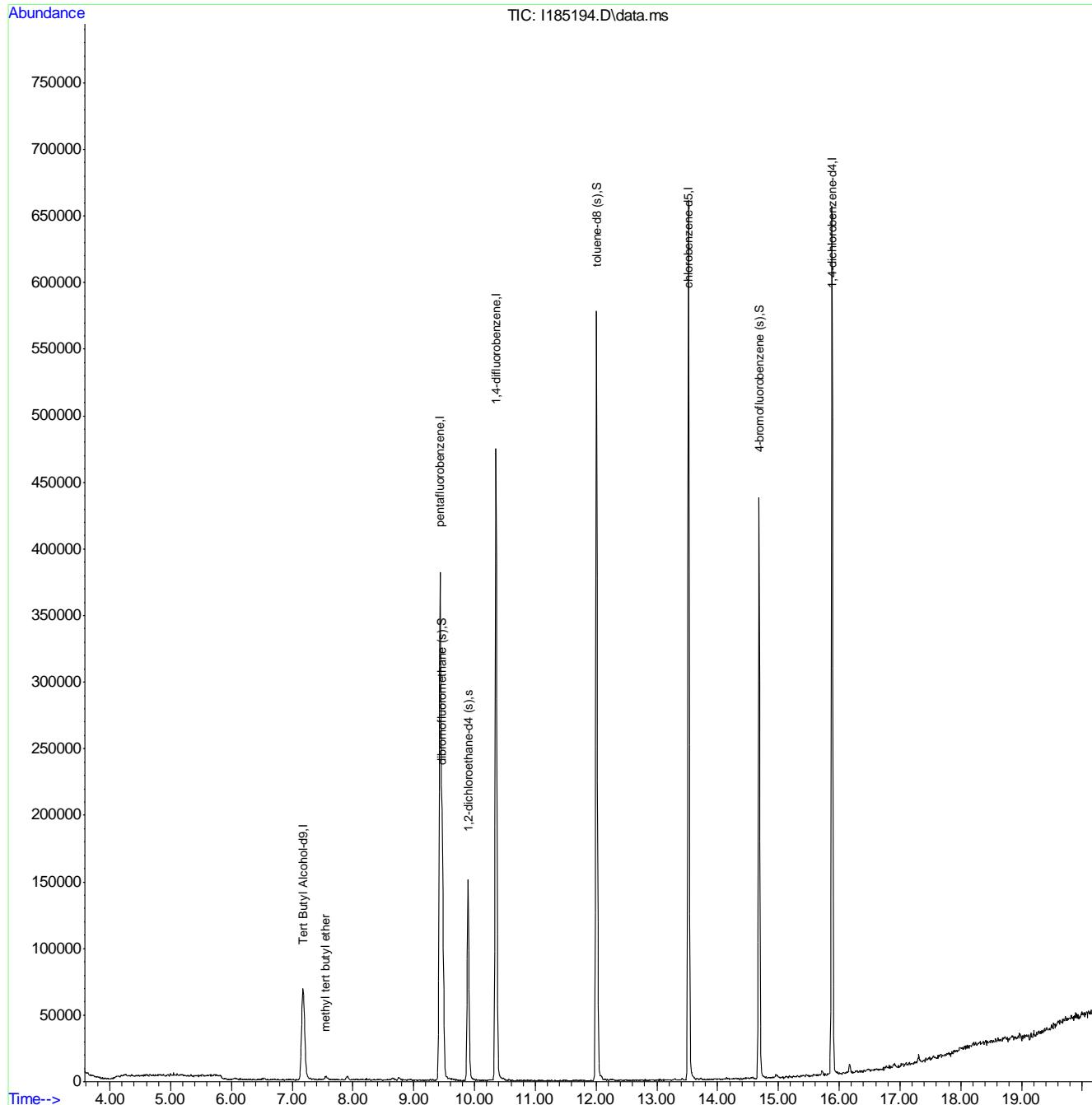
Target Compounds				Qvalue
24) methyl tert butyl ether	7.547	73	3655	0.62 ug/L 98

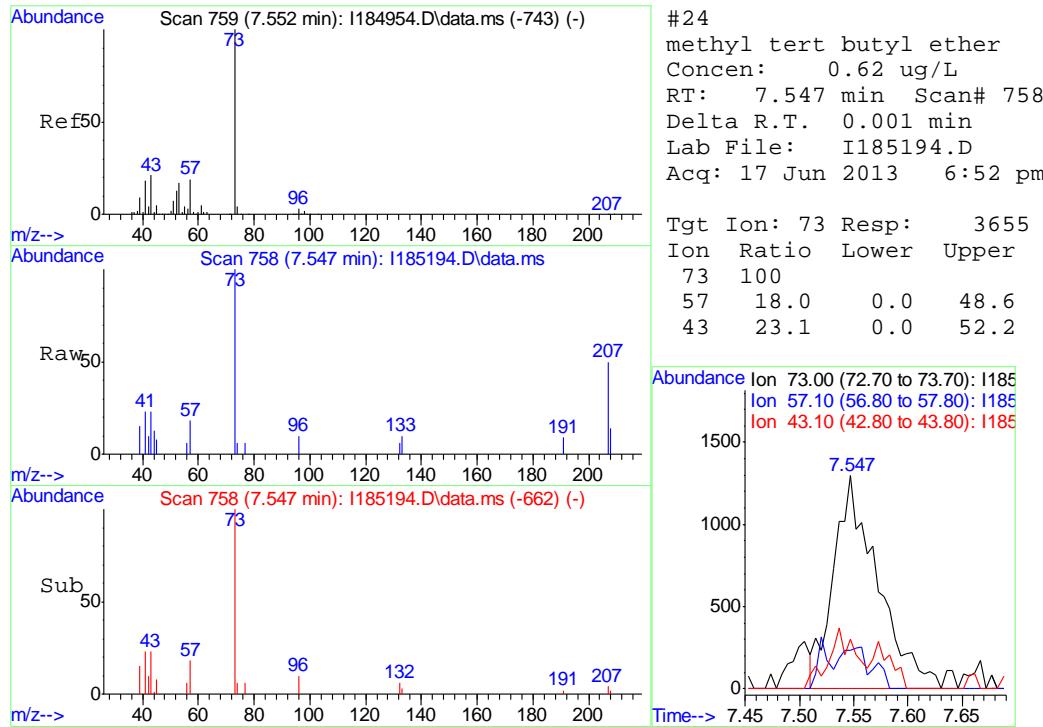
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7481\
 Data File : I185194.D
 Acq On : 17 Jun 2013 6:52 pm
 Operator : SCOTTM
 Sample : JB39439-2,VSL
 Misc : MS49933,VI7481,6.3,,,1
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Jun 18 09:21:54 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7479\
 Data File : I185135.D
 Acq On : 14 Jun 2013 6:13 pm
 Operator : SCOTTM
 Sample : JB39439-3,VSL
 Misc : MS49933,VI7479,7.0,,,1
 ALS Vial : 18 Sample Multiplier: 1

Quant Time: Jun 17 09:08:22 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.175	65	97041	50.00	ug/L	0.00
5) pentafluorobenzene	9.435	168	325478	50.00	ug/L	0.00
46) 1,4-difluorobenzene	10.355	114	456655	50.00	ug/L	0.00
75) chlorobenzene-d5	13.519	117	366790	50.00	ug/L	0.00
90) 1,4-dichlorobenzene-d4	15.883	152	174786	50.00	ug/L	0.00

System Monitoring Compounds

43) dibromofluoromethane (s)	9.471	113	116255	51.08	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	102.16%
47) 1,2-dichloroethane-d4...	9.890	65	128072	51.74	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	103.48%
76) toluene-d8 (s)	12.008	98	415023	51.40	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	102.80%
91) 4-bromofluorobenzene (s)	14.681	95	135740	51.17	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	102.34%

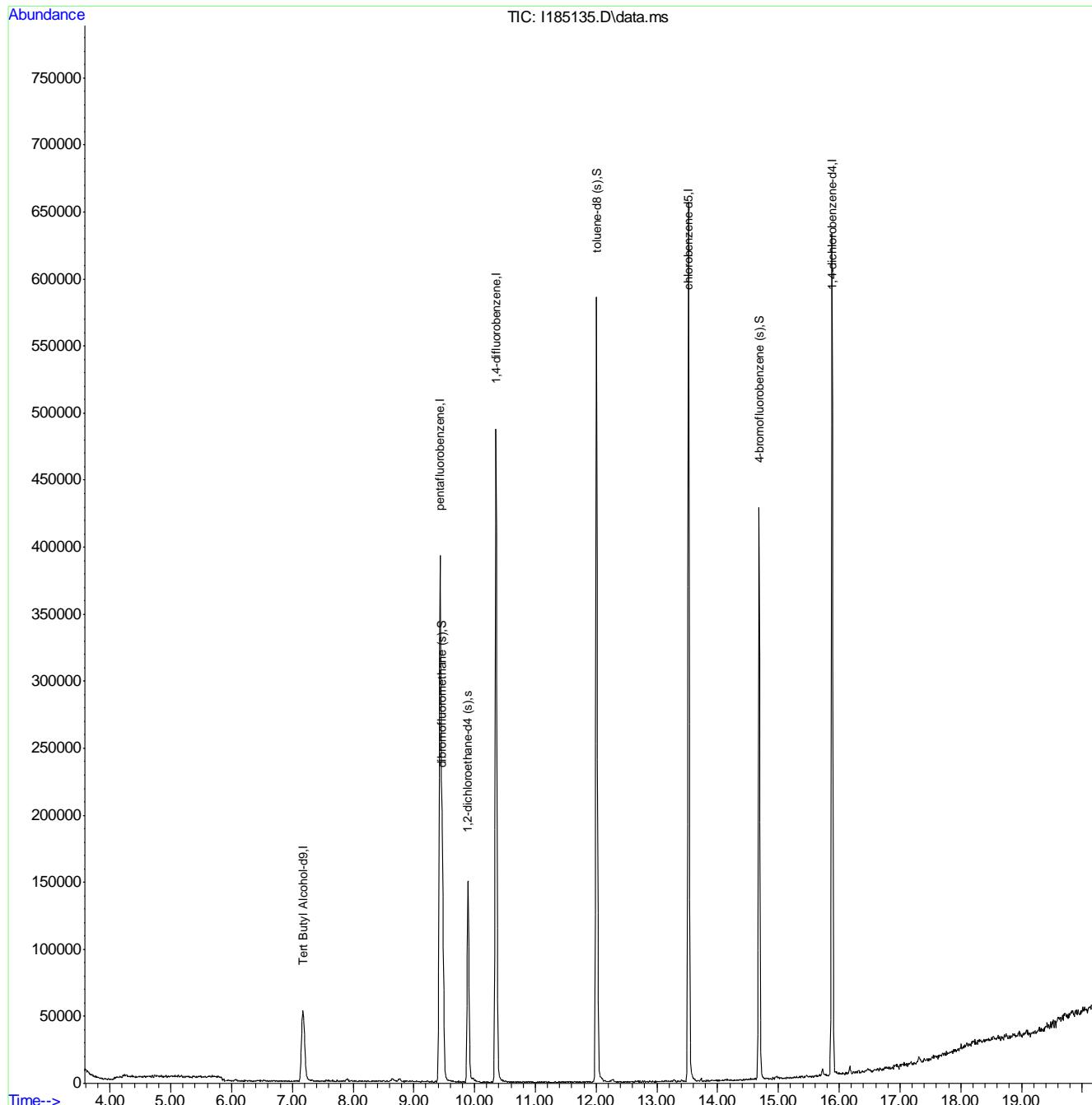
Target Compounds	Qvalue
(#)	= qualifier out of range (m) = manual integration (+) = signals summed

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7479\
 Data File : I185135.D
 Acq On : 14 Jun 2013 6:13 pm
 Operator : SCOTTM
 Sample : JB39439-3,VSL
 Misc : MS49933,VI7479,7.0,,,1
 ALS Vial : 18 Sample Multiplier: 1

Quant Time: Jun 17 09:08:22 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
 Data File : d210122.D
 Acq On : 17 Jun 2013 9:23 pm
 Operator : EmilyT
 Sample : jb39439-4
 Misc : ms49933, vd8577, 6.6,,100,10,1
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Jun 18 08:35:03 2013
 Quant Method : C:\msdchem\1\METHODS\MD8524.M
 Quant Title : SW-846 Method 8260B
 QLast Update : Fri Jun 14 10:55:14 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.996	65	74672	500.00	ug/L	0.00
4) pentafluorobenzene	10.218	168	207697	50.00	ug/L	0.00
53) 1,4-difluorobenzene	11.134	114	274263	50.00	ug/L	0.00
85) chlorobenzene-d5	14.476	117	253620	50.00	ug/L	0.00
99) 1,4-dichlorobenzene-d4	17.059	152	155814	50.00	ug/L	0.00

System Monitoring Compounds						
46) dibromofluoromethane (s)	10.245	113	80159	51.67	ug/L	0.00
Spiked Amount 50.000	Range 65 - 131		Recovery =	103.34%		
47) 1,2-dichloroethane-d4 (s)	10.668	65	104180	54.10	ug/L	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery =	108.20%		
77) toluene-d8 (s)	12.844	98	319017	56.22	ug/L	0.00
Spiked Amount 50.000	Range 80 - 128		Recovery =	112.44%		
101) 4-bromofluorobenzene (s)	15.757	95	117637	51.27	ug/L	0.00
Spiked Amount 50.000	Range 67 - 131		Recovery =	102.54%		

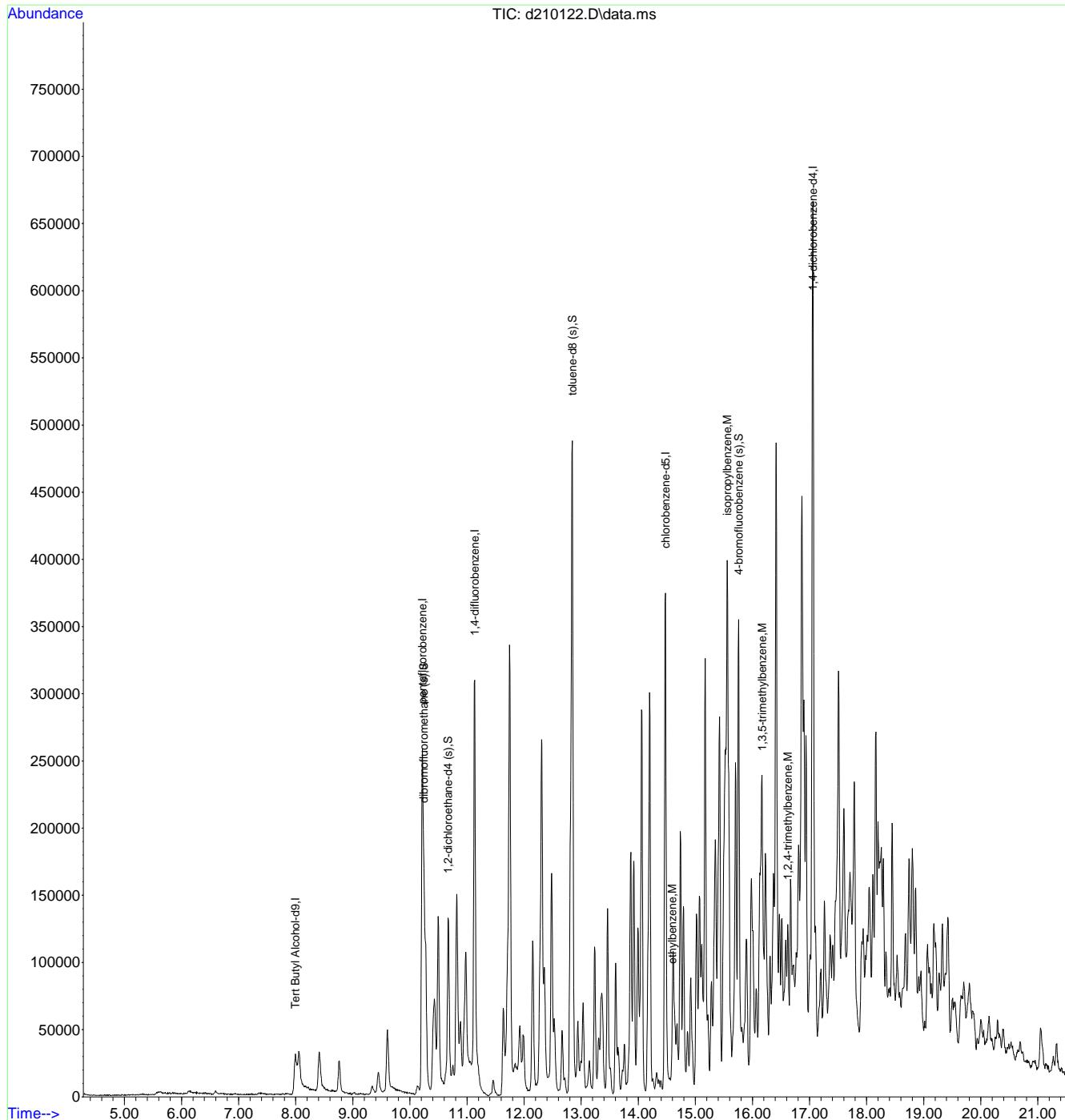
Target Compounds					Qvalue
94) ethylbenzene	14.591	91	9279	1.23	ug/L 92
100) isopropylbenzene	15.553	105	28201	3.39	ug/L 96
111) 1,3,5-trimethylbenzene	16.176	105	13350	1.72	ug/L 87
114) 1,2,4-trimethylbenzene	16.620	105	14692	1.97	ug/L 91

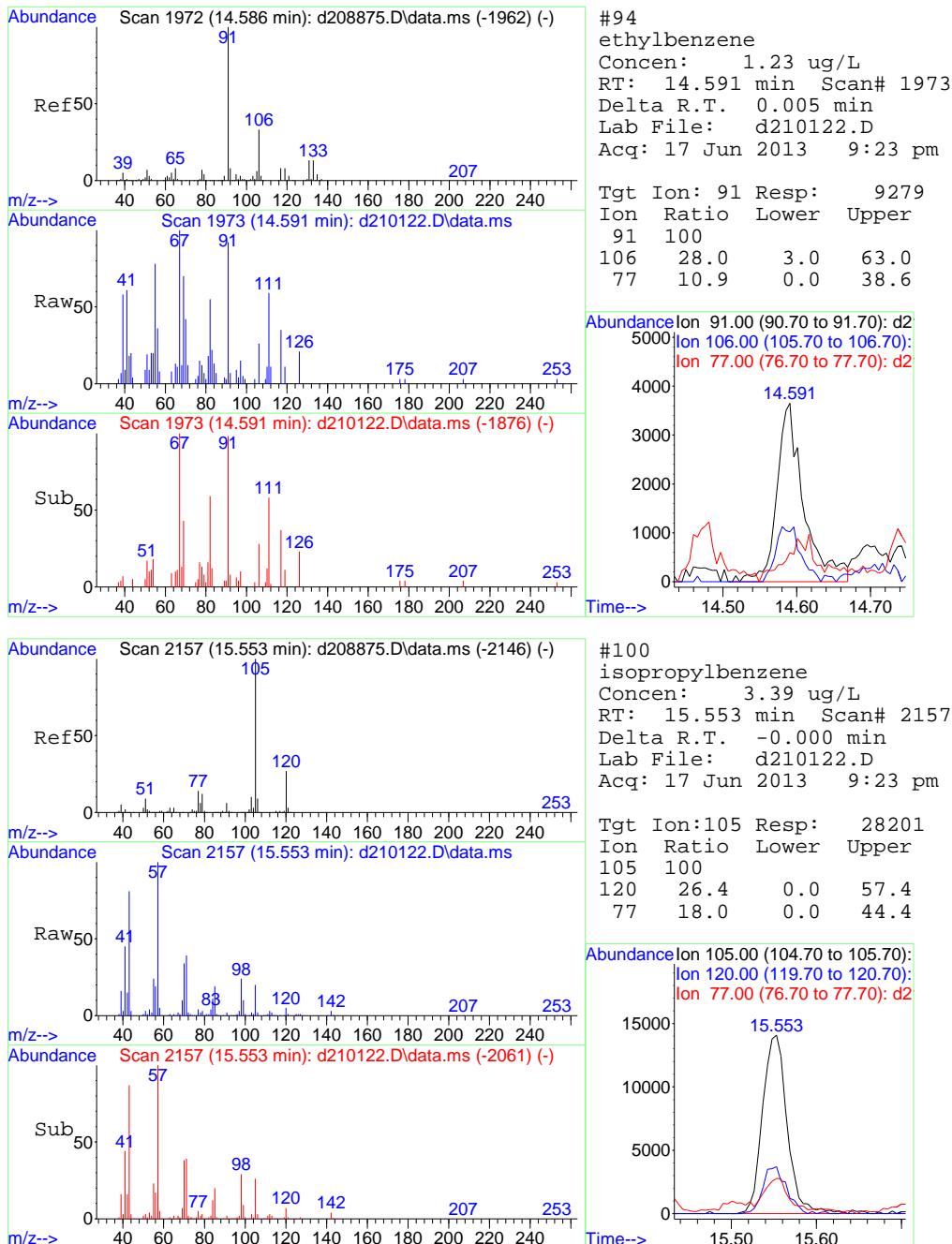
(#) = qualifier out of range (m) = manual integration (+) = signals summed

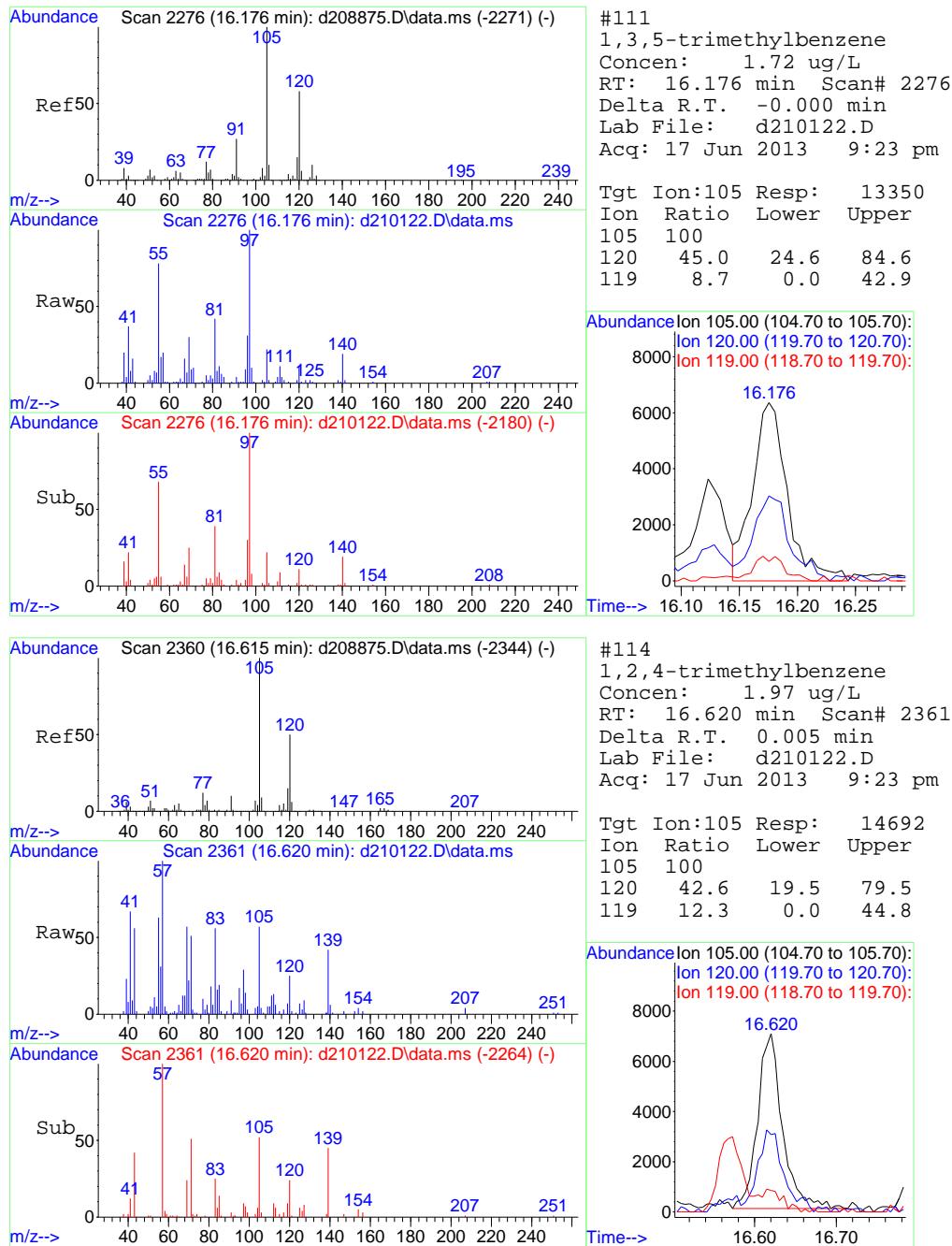
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
 Data File : d210122.D
 Acq On : 17 Jun 2013 9:23 pm
 Operator : EmilyT
 Sample : jb39439-4
 Misc : ms49933, vd8577, 6.6,,100,10,1
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Jun 18 08:35:03 2013
 Quant Method : C:\msdchem\1\METHODS\MD8524.M
 Quant Title : SW-846 Method 8260B
 QLast Update : Fri Jun 14 10:55:14 2013
 Response via : Initial Calibration







Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
 Data File : d210105.D
 Acq On : 17 Jun 2013 12:38 pm
 Operator : EmilyT
 Sample : mb/jb25319f-17a
 Misc : ms49337, vd8577, 5,,100,5,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 17 15:53:32 2013
 Quant Method : C:\msdchem\1\METHODS\MD8524.M
 Quant Title : SW-846 Method 8260B
 QLast Update : Fri Jun 14 10:55:14 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	8.001	65	61145	500.00	ug/L	0.01
4) pentafluorobenzene	10.218	168	182571	50.00	ug/L	0.00
53) 1,4-difluorobenzene	11.128	114	235802	50.00	ug/L	-0.01
85) chlorobenzene-d5	14.476	117	213538	50.00	ug/L	0.00
99) 1,4-dichlorobenzene-d4	17.059	152	133811	50.00	ug/L	0.00

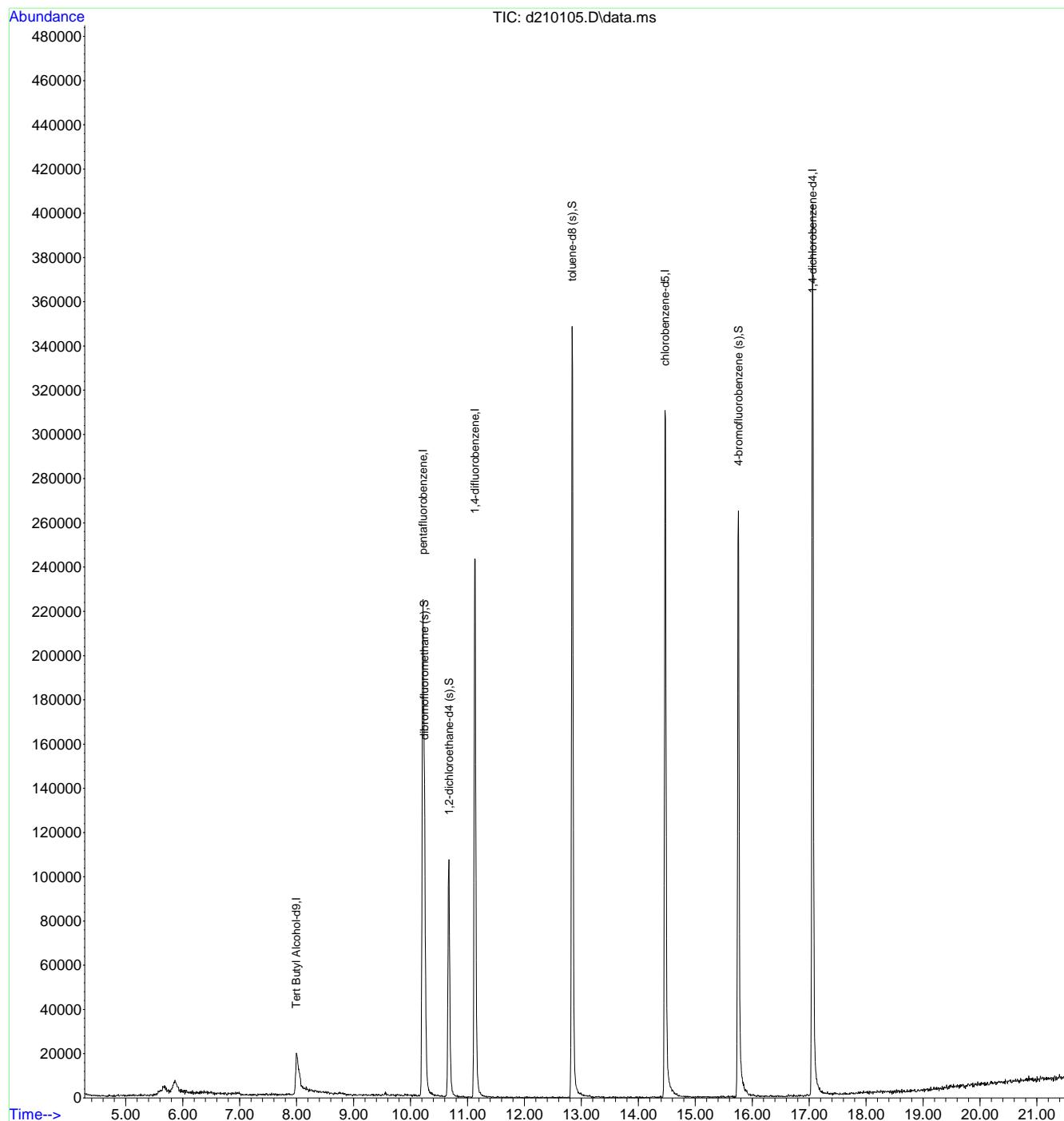
System Monitoring Compounds						
46) dibromofluoromethane (s)	10.250	113	69750	51.15	ug/L	0.00
Spiked Amount	50.000	Range	65 - 131	Recovery	=	102.30%
47) 1,2-dichloroethane-d4 (s)	10.673	65	92639	54.72	ug/L	0.00
Spiked Amount	50.000	Range	70 - 121	Recovery	=	109.44%
77) toluene-d8 (s)	12.839	98	259577	53.21	ug/L	-0.01
Spiked Amount	50.000	Range	80 - 128	Recovery	=	106.42%
101) 4-bromofluorobenzene (s)	15.757	95	102376	51.95	ug/L	0.00
Spiked Amount	50.000	Range	67 - 131	Recovery	=	103.90%

Target Compounds	Qvalue
(#)	= qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
 Data File : d210105.D
 Acq On : 17 Jun 2013 12:38 pm
 Operator : EmilyT
 Sample : mb/jb25319f-17a
 Misc : ms49337, vd8577,5,,100,5,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 17 15:53:32 2013
 Quant Method : C:\msdchem\1\METHODS\MD8524.M
 Quant Title : SW-846 Method 8260B
 QLast Update : Fri Jun 14 10:55:14 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7479\
 Data File : I185124.D
 Acq On : 14 Jun 2013 12:32 pm
 Operator : SCOTTM
 Sample : MB1
 Misc : MS49848,VI7479,,,,,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 14 16:44:29 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.165	65	124339	50.00	ug/L	-0.02
5) pentafluorobenzene	9.435	168	347471	50.00	ug/L	0.00
46) 1,4-difluorobenzene	10.350	114	479607	50.00	ug/L	0.00
75) chlorobenzene-d5	13.519	117	378657	50.00	ug/L	0.00
90) 1,4-dichlorobenzene-d4	15.883	152	182225	50.00	ug/L	0.00

System Monitoring Compounds

43) dibromofluoromethane (s)	9.471	113	121218	49.89	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	99.78%
47) 1,2-dichloroethane-d4...	9.890	65	125401	48.23	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	96.46%
76) toluene-d8 (s)	12.008	98	428656	51.42	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	102.84%
91) 4-bromofluorobenzene (s)	14.680	95	141857	51.30	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	102.60%

Target Compounds

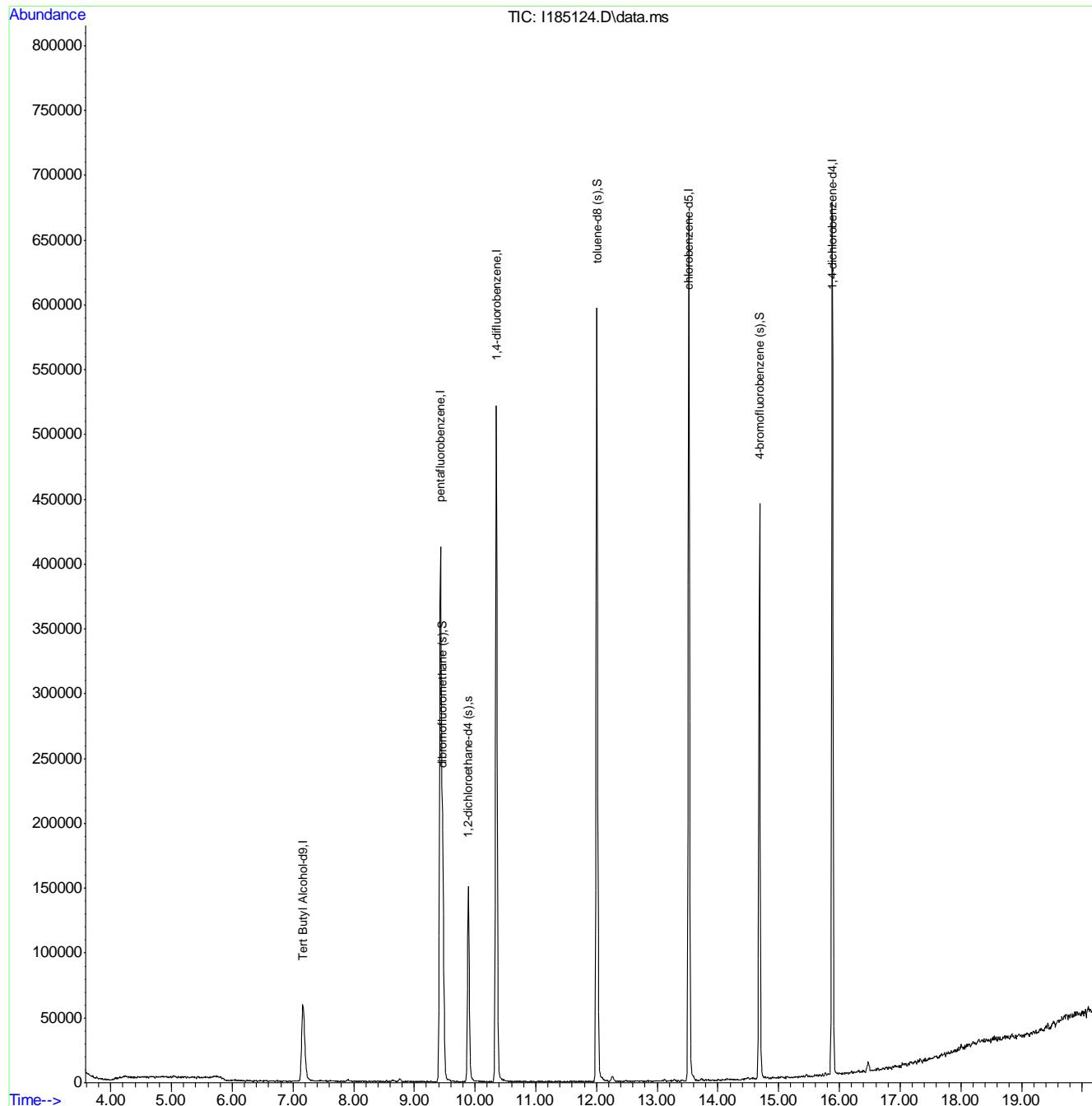
Qvalue

(#= qualifier out of range (m)= manual integration (+)= signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7479\
 Data File : I185124.D
 Acq On : 14 Jun 2013 12:32 pm
 Operator : SCOTTM
 Sample : MB1
 Misc : MS49848,VI7479,,,,,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 14 16:44:29 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7481\
 Data File : I185180.D
 Acq On : 17 Jun 2013 11:52 am
 Operator : SCOTTM
 Sample : MB1
 Misc : MS49972,VI7481,,,,,1
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 17 15:29:43 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.180	65	67326	50.00	ug/L	0.00
5) pentafluorobenzene	9.435	168	319812	50.00	ug/L	0.00
46) 1,4-difluorobenzene	10.355	114	435592	50.00	ug/L	0.00
75) chlorobenzene-d5	13.520	117	341836	50.00	ug/L	0.00
90) 1,4-dichlorobenzene-d4	15.884	152	165346	50.00	ug/L	0.00

System Monitoring Compounds

43) dibromofluoromethane (s)	9.471	113	105485	47.17	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	94.34%
47) 1,2-dichloroethane-d4...	9.890	65	102046	43.22	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	86.44%
76) toluene-d8 (s)	12.008	98	388390	51.61	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	103.22%
91) 4-bromofluorobenzene (s)	14.681	95	125553	50.03	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	100.06%

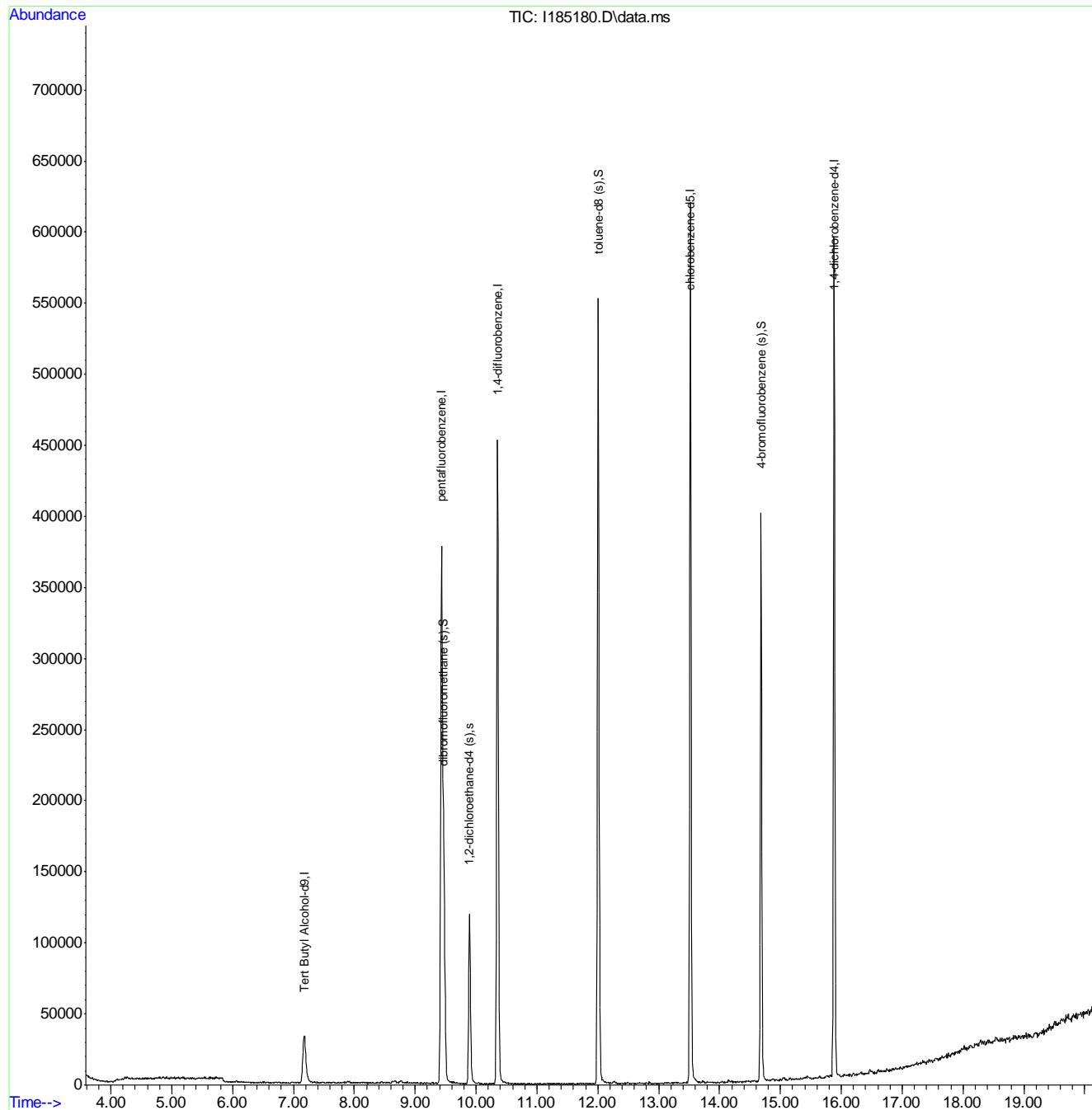
Target Compounds	Qvalue
(#) = qualifier out of range (m) = manual integration (+) = signals summed	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\VI7481\
 Data File : I185180.D
 Acq On : 17 Jun 2013 11:52 am
 Operator : SCOTTM
 Sample : MB1
 Misc : MS49972,VI7481,,,,,1
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 17 15:29:43 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MI7473.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Wed Jun 12 11:48:54 2013
 Response via : Initial Calibration





Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody



CHAIN OF CUSTODY

PAGE OF

2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.acutest.com

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JB39439: Chain of Custody

Page 1 of 2

Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB39439

Client: ACNJ

Immediate Client Services Action Required: No

Date / Time Received: 6/14/2013

Delivery Method:

Client Service Action Required at Login: No

Project: SUB

No. Coolers: 1

Airbill #'s:

Cooler Security**Y or N****Y or N**

1. Custody Seals Present: 3. COC Present:
2. Custody Seals Intact: 4. Smpl Dates/Time OK

Cooler Temperature**Y or N**

1. Temp criteria achieved:
2. Cooler temp verification: Infared gun
3. Cooler media: Ice (bag)

Quality Control Preservation**Y or N****N/A**

1. Trip Blank present / cooler:
2. Trip Blank listed on COC:
3. Samples preserved properly:
4. VOCs headspace free:

Sample Integrity - Documentation**Y or N**

1. Sample labels present on bottles:
2. Container labeling complete:
3. Sample container label / COC agree:

Sample Integrity - Condition**Y or N**

1. Sample rcvd within HT:
2. All containers accounted for:
3. Condition of sample: Intact

Sample Integrity - Instructions**Y or N****N/A**

1. Analysis requested is clear:
2. Bottles received for unspecified tests:
3. Sufficient volume rcvd for analysis:
4. Compositing instructions clear:
5. Filtering instructions clear:

Comments

Accutest Laboratories
V:508.481.6200495 Technology Center West, Bldg One
F: 508.481.7753Marlborough, MA
www.accutest.com

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JB39439: Chain of Custody**Page 2 of 2**

Internal Sample Tracking Chronicle

Accutest New Jersey

Job No: JB39439

AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JB39439-1	Collected: 12-JUN-13 08:00 By: LM		Received: 12-JUN-13 By:			
	AOI-5_MW-464_0-2'_61213					
JB39439-1	SM21 2540 B MOD.	17-JUN-13	HS			% SOL
JB39439-1	SW846 6010C	17-JUN-13 18:20	EAL	14-JUN-13 DA		PB
JB39439-1	SW846 8011	19-JUN-13 16:24	AP	18-JUN-13 CC		V8011EDB
JB39439-1	SW846 8270C	19-JUN-13 20:09	KR	17-JUN-13 PA		B8270SL
JB39439-2	Collected: 12-JUN-13 09:00 By: LM		Received: 12-JUN-13 By:			
	AOI-5_MW-464_2-4'_61213					
JB39439-2	SM21 2540 B MOD.	17-JUN-13	HS			% SOL
JB39439-2	SW846 6010C	17-JUN-13 18:24	EAL	14-JUN-13 DA		PB
JB39439-2	SW846 8011	19-JUN-13 16:51	AP	18-JUN-13 CC		V8011EDB
JB39439-2	SW846 8270C	19-JUN-13 20:32	KR	17-JUN-13 PA		B8270SL
JB39439-3	Collected: 12-JUN-13 10:00 By: LM		Received: 12-JUN-13 By:			
	AOI5_MW-467_0-1_061213					
JB39439-3	SM21 2540 B MOD.	17-JUN-13	HS			% SOL
JB39439-3	SW846 6010C	17-JUN-13 18:28	EAL	14-JUN-13 DA		PB
JB39439-3	SW846 8011	19-JUN-13 17:18	AP	18-JUN-13 CC		V8011EDB
JB39439-3	SW846 8270C	19-JUN-13 20:56	KR	17-JUN-13 PA		B8270SL
JB39439-4	Collected: 12-JUN-13 11:00 By: LM		Received: 12-JUN-13 By:			
	AOI5_MW-467_9-10_061213					
JB39439-4	SM21 2540 B MOD.	17-JUN-13	HS			% SOL
JB39439-4	SW846 6010C	17-JUN-13 18:33	EAL	14-JUN-13 DA		PB
JB39439-4	SW846 8011	19-JUN-13 17:47	AP	18-JUN-13 CC		V8011EDB
JB39439-4	SW846 8270C	19-JUN-13 21:19	KR	17-JUN-13 PA		B8270SL

Accutest Internal Chain of Custody

Page 1 of 2

Job Number: JB39439
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 06/12/13

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB39439-1.1	Walk In Ref #9	Dorina Antonovici	06/14/13 16:03	Retrieve from Storage
JB39439-1.1	Dorina Antonovici	Walk In Ref #9	06/14/13 17:01	Return to Storage
JB39439-1.1	Walk In Ref #9	Hamid Siamak	06/17/13 08:34	Retrieve from Storage
JB39439-1.1	Hamid Siamak	Walk In Ref #9	06/17/13 11:17	Return to Storage
JB39439-1.1	Walk In Ref #9	Michael Rolo	06/18/13 10:37	Retrieve from Storage
JB39439-1.1	Michael Rolo	Walk In Ref #9	06/18/13 11:29	Return to Storage
JB39439-1.1	Walk In Ref #9	Chris Cataldo	06/18/13 18:38	Retrieve from Storage
JB39439-1.1	Chris Cataldo	Walk In Ref #9	06/18/13 18:38	Return to Storage
JB39439-1.2	Walk In Ref #9	Michael Rolo	06/17/13 08:37	Retrieve from Storage
JB39439-1.2	Michael Rolo	Walk In Ref #9	06/17/13 14:51	Return to Storage
JB39439-2.1	Walk In Ref #9	Dorina Antonovici	06/14/13 16:03	Retrieve from Storage
JB39439-2.1	Dorina Antonovici	Walk In Ref #9	06/14/13 17:01	Return to Storage
JB39439-2.1	Walk In Ref #9	Hamid Siamak	06/17/13 08:34	Retrieve from Storage
JB39439-2.1	Hamid Siamak	Walk In Ref #9	06/17/13 11:17	Return to Storage
JB39439-2.1	Walk In Ref #9	Michael Rolo	06/18/13 10:37	Retrieve from Storage
JB39439-2.1	Michael Rolo	Walk In Ref #9	06/18/13 11:29	Return to Storage
JB39439-2.1	Walk In Ref #9	Chris Cataldo	06/18/13 18:38	Retrieve from Storage
JB39439-2.1	Chris Cataldo	Walk In Ref #9	06/18/13 18:38	Return to Storage
JB39439-2.2	Walk In Ref #9	Michael Rolo	06/17/13 08:37	Retrieve from Storage
JB39439-2.2	Michael Rolo	Walk In Ref #9	06/17/13 14:51	Return to Storage
JB39439-3.1	Walk In Ref #9	Dorina Antonovici	06/14/13 16:03	Retrieve from Storage
JB39439-3.1	Dorina Antonovici	Walk In Ref #9	06/14/13 17:01	Return to Storage
JB39439-3.1	Walk In Ref #9	Hamid Siamak	06/17/13 08:34	Retrieve from Storage
JB39439-3.1	Hamid Siamak	Walk In Ref #9	06/17/13 11:17	Return to Storage
JB39439-3.1	Walk In Ref #9	Michael Rolo	06/18/13 10:37	Retrieve from Storage
JB39439-3.1	Michael Rolo	Walk In Ref #9	06/18/13 11:29	Return to Storage
JB39439-3.1	Walk In Ref #9	Chris Cataldo	06/18/13 18:38	Retrieve from Storage
JB39439-3.1	Chris Cataldo	Walk In Ref #9	06/18/13 18:38	Return to Storage
JB39439-3.2	Walk In Ref #9	Michael Rolo	06/17/13 08:37	Retrieve from Storage
JB39439-3.2	Michael Rolo	Walk In Ref #9	06/17/13 14:51	Return to Storage
JB39439-4.1	Walk In Ref #9	Dorina Antonovici	06/14/13 16:03	Retrieve from Storage
JB39439-4.1	Dorina Antonovici	Walk In Ref #9	06/14/13 17:01	Return to Storage
JB39439-4.1	Walk In Ref #9	Hamid Siamak	06/17/13 08:34	Retrieve from Storage
JB39439-4.1	Hamid Siamak	Walk In Ref #9	06/17/13 11:17	Return to Storage
JB39439-4.1	Walk In Ref #9	Michael Rolo	06/18/13 10:37	Retrieve from Storage
JB39439-4.1	Michael Rolo	Walk In Ref #9	06/18/13 11:29	Return to Storage
JB39439-4.1	Walk In Ref #9	Chris Cataldo	06/18/13 18:38	Retrieve from Storage
JB39439-4.1	Chris Cataldo	Walk In Ref #9	06/18/13 18:38	Return to Storage

Accutest Internal Chain of Custody

Page 2 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Received: 06/12/13

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
-------------------------	------------------	----------------	-----------	--------

JB39439-4.2 Walk In Ref #9 Michael Rolo 06/17/13 08:37 Retrieve from Storage
JB39439-4.2 Michael Rolo Walk In Ref #9 06/17/13 14:51 Return to Storage



GC/MS Semi-volatiles

QC Data Summaries

(Accutest Labs of New England, Inc.)

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (DFTPP)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33636-MB	R31555.D	1	06/19/13	KR	06/17/13	OP33636	MSR1148

The QC reported here applies to the following samples:

Method: SW846 8270C

JB39439-1, JB39439-2, JB39439-3, JB39439-4

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	100	12	ug/kg	
56-55-3	Benzo(a)anthracene	ND	100	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	100	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	100	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	100	9.9	ug/kg	
218-01-9	Chrysene	ND	100	12	ug/kg	
86-73-7	Fluorene	ND	100	13	ug/kg	
91-20-3	Naphthalene	ND	100	16	ug/kg	
85-01-8	Phenanthrene	ND	100	13	ug/kg	
129-00-0	Pyrene	ND	100	12	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	60% 30-130%
4165-62-2	Phenol-d5	59% 30-130%
118-79-6	2,4,6-Tribromophenol	66% 30-130%
4165-60-0	Nitrobenzene-d5	53% 30-130%
321-60-8	2-Fluorobiphenyl	64% 30-130%
1718-51-0	Terphenyl-d14	75% 30-130%

Blank Spike Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33636-BS	R31556.D	1	06/19/13	KR	06/17/13	OP33636	MSR1148

The QC reported here applies to the following samples:

Method: SW846 8270C

JB39439-1, JB39439-2, JB39439-3, JB39439-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
120-12-7	Anthracene	2490	1970	79	40-140
56-55-3	Benzo(a)anthracene	2490	2250	91	40-140
50-32-8	Benzo(a)pyrene	2490	1910	77	40-140
205-99-2	Benzo(b)fluoranthene	2490	2300	93	40-140
191-24-2	Benzo(g,h,i)perylene	2490	2190	88	40-140
218-01-9	Chrysene	2490	2150	87	40-140
86-73-7	Fluorene	2490	1950	78	40-140
91-20-3	Naphthalene	2490	2380	96	40-140
85-01-8	Phenanthrene	2490	2080	84	40-140
129-00-0	Pyrene	2490	2030	82	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	69%	30-130%
4165-62-2	Phenol-d5	68%	30-130%
118-79-6	2,4,6-Tribromophenol	84%	30-130%
4165-60-0	Nitrobenzene-d5	61%	30-130%
321-60-8	2-Fluorobiphenyl	75%	30-130%
1718-51-0	Terphenyl-d14	86%	30-130%

* = Outside of Control Limits.

9.2.1

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Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33636-MS	R31557.D	1	06/19/13	KR	06/17/13	OP33636	MSR1148
OP33636-MSD	R31558.D	1	06/19/13	KR	06/17/13	OP33636	MSR1148
JB39339-1	R31559.D	1	06/19/13	KR	06/17/13	OP33636	MSR1148

The QC reported here applies to the following samples:

Method: SW846 8270C

JB39439-1, JB39439-2, JB39439-3, JB39439-4

CAS No.	Compound	JB39339-1		Spike	MS	MS	MSD	MSD	Limits	
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	%	RPD	Rec/RPD
120-12-7	Anthracene	ND		2930	2500	85	2390	82	4	40-140/30
56-55-3	Benzo(a)anthracene	ND		2930	2850	97	2670	92	7	40-140/30
50-32-8	Benzo(a)pyrene	ND		2930	2430	83	2290	79	6	40-140/30
205-99-2	Benzo(b)fluoranthene	ND		2930	2890	99	2650	91	9	40-140/30
191-24-2	Benzo(g,h,i)perylene	ND		2930	2720	93	2580	88	5	40-140/30
218-01-9	Chrysene	ND		2930	2700	92	2550	87	6	40-140/30
86-73-7	Fluorene	ND		2930	2500	85	2390	82	4	40-140/30
91-20-3	Naphthalene	1030		2930	3790	94	3970	101	5	40-140/30
85-01-8	Phenanthrene	24.2	J	2930	2600	88	2490	85	4	40-140/30
129-00-0	Pyrene	ND		2930	2540	87	2380	82	7	40-140/30

CAS No.	Surrogate Recoveries	MS	MSD	JB39339-1	Limits
367-12-4	2-Fluorophenol	73%	69%		30-130%
4165-62-2	Phenol-d5	70%	69%		30-130%
118-79-6	2,4,6-Tribromophenol	90%	87%		30-130%
4165-60-0	Nitrobenzene-d5	70%	69%	65%	30-130%
321-60-8	2-Fluorobiphenyl	78%	77%	74%	30-130%
1718-51-0	Terphenyl-d14	88%	85%	84%	30-130%

* = Outside of Control Limits.

9.3.1
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Instrument Performance Check (DFTPP)

Page 1 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: MSR1128-DFTPP
Lab File ID: R30967.D
Instrument ID: GCMSR

Injection Date: 05/30/13
Injection Time: 07:23

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	8712	39.1	Pass
68	Less than 2.0% of mass 69	0	0.00 (0.00) ^a	Pass
69	Mass 69 relative abundance	9649	43.3	Pass
70	Less than 2.0% of mass 69	0	0.00 (0.00) ^a	Pass
127	40.0 - 60.0% of mass 198	10803	48.5	Pass
197	Less than 1.0% of mass 198	91	0.41	Pass
198	Base peak, 100% relative abundance	22289	100.0	Pass
199	5.0 - 9.0% of mass 198	1599	7.17	Pass
275	10.0 - 30.0% of mass 198	5321	23.9	Pass
365	1.0 - 100.0% of mass 198	649	2.91	Pass
441	Present, but less than mass 443	2539	11.4 (85.0) ^b	Pass
442	40.0 - 100.0% of mass 198	15916	71.4	Pass
443	17.0 - 23.0% of mass 442	2986	13.4 (18.8) ^c	Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
MSR1128-ICC1128	R30970.D	05/30/13	08:31	01:08	Initial cal 50
MSR1128-IC1128	R30971.D	05/30/13	08:54	01:31	Initial cal 2
MSR1128-IC1128	R30972.D	05/30/13	09:17	01:54	Initial cal 5
MSR1128-IC1128	R30973.D	05/30/13	09:40	02:17	Initial cal 10
MSR1128-IC1128	R30974.D	05/30/13	10:03	02:40	Initial cal 20
MSR1128-IC1128	R30975.D	05/30/13	10:26	03:03	Initial cal 80
MSR1128-IC1128	R30976.D	05/30/13	10:49	03:26	Initial cal 120
MSR1128-IC1128	R30977.D	05/30/13	11:12	03:49	Initial cal 160
MSR1128-ICV1128	R30978.D	05/30/13	11:35	04:12	Initial cal verification 50
MSR1128-ICV1128	R30979.D	05/30/13	12:01	04:38	Initial cal verification 20
MSR1128-ICV1128	R30980.D	05/30/13	12:24	05:01	Initial cal verification 20
OP33361-MB	R30981.D	05/30/13	12:47	05:24	Method Blank
OP33361-BS	R30982.D	05/30/13	13:10	05:47	Blank Spike
ZZZZZZ	R30983.D	05/30/13	13:33	06:10	(unrelated sample)
OP33248-MB	R30984.D	05/30/13	13:56	06:33	Method Blank
OP33248-BS	R30985.D	05/30/13	14:19	06:56	Blank Spike
OP33248-MS	R30986.D	05/30/13	14:42	07:19	Matrix Spike
OP33248-MSD	R30987.D	05/30/13	15:05	07:42	Matrix Spike Duplicate
MC21000-8	R30988.D	05/30/13	15:28	08:05	(used for QC only; not part of job JB39439)

9.4.1
6

Instrument Performance Check (DFTPP)

Page 2 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSR1128-DFTPP	Injection Date:	05/30/13
Lab File ID:	R30967.D	Injection Time:	07:23
Instrument ID:	GCMSR		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	R30989.D	05/30/13	15:51	08:28	(unrelated sample)
ZZZZZZ	R30990.D	05/30/13	16:15	08:52	(unrelated sample)
ZZZZZZ	R30991.D	05/30/13	16:38	09:15	(unrelated sample)
ZZZZZZ	R30992.D	05/30/13	17:01	09:38	(unrelated sample)
ZZZZZZ	R30993.D	05/30/13	17:24	10:01	(unrelated sample)
ZZZZZZ	R30994.D	05/30/13	17:47	10:24	(unrelated sample)
ZZZZZZ	R30995.D	05/30/13	18:10	10:47	(unrelated sample)
ZZZZZZ	R30996.D	05/30/13	18:33	11:10	(unrelated sample)
ZZZZZZ	R30997.D	05/30/13	18:56	11:33	(unrelated sample)
ZZZZZZ	R30998.D	05/30/13	19:19	11:56	(unrelated sample)
ZZZZZZ	R30999.D	05/30/13	19:42	12:19	(unrelated sample)

1.4.1
6

Instrument Performance Check (DFTPP)

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSR1148-DFTPP	Injection Date:	06/19/13
Lab File ID:	R31551.D	Injection Time:	07:52
Instrument ID:	GCMSR		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	22429	33.5	Pass
68	Less than 2.0% of mass 69	117	0.17 (0.46) ^a	Pass
69	Mass 69 relative abundance	25347	37.9	Pass
70	Less than 2.0% of mass 69	0	0.00 (0.00) ^a	Pass
127	40.0 - 60.0% of mass 198	30211	45.2	Pass
197	Less than 1.0% of mass 198	465	0.70	Pass
198	Base peak, 100% relative abundance	66861	100.0	Pass
199	5.0 - 9.0% of mass 198	4844	7.24	Pass
275	10.0 - 30.0% of mass 198	16910	25.3	Pass
365	1.0 - 100.0% of mass 198	1924	2.88	Pass
441	Present, but less than mass 443	8984	13.4 (79.4) ^b	Pass
442	40.0 - 100.0% of mass 198	61867	92.5	Pass
443	17.0 - 23.0% of mass 442	11318	16.9 (18.3) ^c	Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
MSR1148-CC1128	R31552.D	06/19/13	08:17	00:25	Continuing cal 80
OP33599-MB	R31553.D	06/19/13	08:41	00:49	Method Blank
OP33599-BS	R31554.D	06/19/13	09:04	01:12	Blank Spike
OP33636-MB	R31555.D	06/19/13	09:27	01:35	Method Blank
OP33636-BS	R31556.D	06/19/13	09:51	01:59	Blank Spike
OP33636-MS	R31557.D	06/19/13	10:14	02:22	Matrix Spike
OP33636-MSD	R31558.D	06/19/13	10:37	02:45	Matrix Spike Duplicate
JB39339-1	R31559.D	06/19/13	11:00	03:08	(used for QC only; not part of job JB39439)
ZZZZZZ	R31560.D	06/19/13	11:23	03:31	(unrelated sample)
ZZZZZZ	R31561.D	06/19/13	11:46	03:54	(unrelated sample)
ZZZZZZ	R31562.D	06/19/13	12:09	04:17	(unrelated sample)
ZZZZZZ	R31563.D	06/19/13	12:33	04:41	(unrelated sample)
ZZZZZZ	R31564.D	06/19/13	12:55	05:03	(unrelated sample)
ZZZZZZ	R31565.D	06/19/13	13:18	05:26	(unrelated sample)
ZZZZZZ	R31566.D	06/19/13	13:42	05:50	(unrelated sample)
ZZZZZZ	R31567.D	06/19/13	14:05	06:13	(unrelated sample)
ZZZZZZ	R31568.D	06/19/13	14:28	06:36	(unrelated sample)
ZZZZZZ	R31569.D	06/19/13	14:51	06:59	(unrelated sample)
ZZZZZZ	R31570.D	06/19/13	15:14	07:22	(unrelated sample)

Instrument Performance Check (DFTPP)

Page 1 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSR1149-DFTPP	Injection Date:	06/19/13
Lab File ID:	R31571.D	Injection Time:	17:28
Instrument ID:	GCMSR		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	16366	32.4	Pass
68	Less than 2.0% of mass 69	293	0.58 (1.55) ^a	Pass
69	Mass 69 relative abundance	18921	37.5	Pass
70	Less than 2.0% of mass 69	0	0.00 (0.00) ^a	Pass
127	40.0 - 60.0% of mass 198	21971	43.5	Pass
197	Less than 1.0% of mass 198	186	0.37	Pass
198	Base peak, 100% relative abundance	50520	100.0	Pass
199	5.0 - 9.0% of mass 198	3621	7.17	Pass
275	10.0 - 30.0% of mass 198	12400	24.5	Pass
365	1.0 - 100.0% of mass 198	1623	3.21	Pass
441	Present, but less than mass 443	7393	14.6 (82.2) ^b	Pass
442	40.0 - 100.0% of mass 198	48859	96.7	Pass
443	17.0 - 23.0% of mass 442	8991	17.8 (18.4) ^c	Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
MSR1149-CC1128	R31572.D	06/19/13	17:51	00:23	Continuing cal 80
OP33617-MB	R31573.D	06/19/13	18:14	00:46	Method Blank
OP33617-BS	R31574.D	06/19/13	18:37	01:09	Blank Spike
OP33617-MS	R31575.D	06/19/13	19:00	01:32	Matrix Spike
OP33617-MSD	R31576.D	06/19/13	19:23	01:55	Matrix Spike Duplicate
MC21708-1	R31577.D	06/19/13	19:46	02:18	(used for QC only; not part of job JB39439)
JB39439-1	R31578.D	06/19/13	20:09	02:41	AOI-5_MW-464_0-2'_61213
JB39439-2	R31579.D	06/19/13	20:32	03:04	AOI-5_MW-464_2-4'_61213
JB39439-3	R31580.D	06/19/13	20:56	03:28	AOI5_MW-467_0-1_061213
JB39439-4	R31581.D	06/19/13	21:19	03:51	AOI5_MW-467_9-10_061213
ZZZZZZ	R31582.D	06/19/13	21:44	04:16	(unrelated sample)
OP33599-MS	R31583.D	06/19/13	22:08	04:40	Matrix Spike
OP33599-MSD	R31584.D	06/19/13	22:32	05:04	Matrix Spike Duplicate
MC21696-1	R31585.D	06/19/13	22:56	05:28	(used for QC only; not part of job JB39439)
ZZZZZZ	R31586.D	06/19/13	23:20	05:52	(unrelated sample)
ZZZZZZ	R31587.D	06/19/13	23:44	06:16	(unrelated sample)
ZZZZZZ	R31588.D	06/20/13	00:09	06:41	(unrelated sample)
ZZZZZZ	R31589.D	06/20/13	00:33	07:05	(unrelated sample)
ZZZZZZ	R31590.D	06/20/13	00:57	07:29	(unrelated sample)

Instrument Performance Check (DFTPP)

Page 2 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSR1149-DFTPP	Injection Date:	06/19/13
Lab File ID:	R31571.D	Injection Time:	17:28
Instrument ID:	GCMSR		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	R31591.D	06/20/13	01:21	07:53	(unrelated sample)
ZZZZZZ	R31592.D	06/20/13	01:45	08:17	(unrelated sample)
ZZZZZZ	R31593.D	06/20/13	02:09	08:41	(unrelated sample)
ZZZZZZ	R31594.D	06/20/13	02:33	09:05	(unrelated sample)
ZZZZZZ	R31595.D	06/20/13	02:58	09:30	(unrelated sample)
ZZZZZZ	R31596.D	06/20/13	03:22	09:54	(unrelated sample)
ZZZZZZ	R31597.D	06/20/13	03:46	10:18	(unrelated sample)
ZZZZZZ	R31598.D	06/20/13	04:10	10:42	(unrelated sample)
ZZZZZZ	R31599.D	06/20/13	04:34	11:06	(unrelated sample)
ZZZZZZ	R31600.D	06/20/13	04:58	11:30	(unrelated sample)
ZZZZZZ	R31601.D	06/20/13	05:22	11:54	(unrelated sample)

9.4.3
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Semivolatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSR1148-CC1128	Injection Date: 06/19/13	
Lab File ID:	R31552.D	Injection Time: 08:17	
Instrument ID:	GCMSR	Method: SW846 8270C	

	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6				
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	89573	4.02	349886	5.07	209135	6.59	356913	7.96	395912	10.90
Upper Limit ^a	179146	4.52	699772	5.57	418270	7.09	713826	8.46	791824	11.40
Lower Limit ^b	44787	3.52	174943	4.57	104568	6.09	178457	7.46	197956	10.40

Lab Sample ID	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
	AREA	RT	AREA	RT	AREA	RT
OP33599-MB	76682	4.02	299281	5.06	179213	6.59
OP33599-BS	84989	4.02	325311	5.06	189380	6.59
OP33636-MB	77529	4.02	300243	5.06	175920	6.59
OP33636-BS	79084	4.02	306653	5.06	177904	6.59
OP33636-MS	73935	4.02	282290	5.06	166379	6.59
OP33636-MSD	84563	4.02	322219	5.07	188832	6.59
JB39339-1	79420	4.02	304544	5.06	178909	6.59
ZZZZZZ	87376	4.03	337401	5.08	186134	6.59
ZZZZZZ	76787	4.02	299212	5.06	174113	6.59
ZZZZZZ	81557	4.02	314602	5.06	184153	6.59
ZZZZZZ	78747	4.02	300050	5.06	176287	6.59
ZZZZZZ	77082	4.02	291161	5.06	172041	6.59
ZZZZZZ	78384	4.01	294360	5.06	173194	6.59
ZZZZZZ	82099	4.02	315875	5.06	184343	6.59
ZZZZZZ	69040	4.02	267782	5.06	162842	6.59
ZZZZZZ	76984	4.02	302826	5.06	179504	6.59
ZZZZZZ	74443	4.02	288387	5.06	172458	6.59
ZZZZZZ	75059	4.02	288012	5.06	171473	6.59

IS 1 = 1,4-Dichlorobenzene-d4

IS 2 = Naphthalene-d8

IS 3 = Acenaphthene-D10

IS 4 = Phenanthrene-d10

IS 5 = Chrysene-d12

IS 6 = Perylene-d12

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

9.5.1
6

Semivolatile Internal Standard Area Summary

Page 1 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSR1149-CC1128					Injection Date:	06/19/13				
Lab File ID:	R31572.D					Injection Time:	17:51				
Instrument ID:	GCMSR					Method:	SW846 8270C				

	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA
Check Std	77949	4.02	291528	5.07	177322	6.59	298068
Upper Limit ^a	155898	4.52	583056	5.57	354644	7.09	596136
Lower Limit ^b	38975	3.52	145764	4.57	88661	6.09	149034

Lab Sample ID	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA
OP33617-MB	95727	4.02	373189	5.06	219624	6.59	365330
OP33617-BS	104064	4.02	391155	5.06	223796	6.59	357770
OP33617-MS	115289	4.02	427121	5.06	237078	6.59	374211
OP33617-MSD	115647	4.02	437938	5.06	239406	6.59	370188
MC21708-1	100426	4.02	371700	5.06	207349	6.59	325373
JB39439-1	102148	4.02	382051	5.06	215048	6.59	334274
JB39439-2	108790	4.02	412879	5.06	234595	6.59	363567
JB39439-3	110059	4.02	405456	5.06	221018	6.59	338369
JB39439-4	101189	4.02	381336	5.07	200211	6.59	317355
ZZZZZZ	94523	4.02	355308	5.06	198091	6.59	314533
OP33599-MS	99904	4.02	370390	5.07	198680	6.59	305429
OP33599-MSD	96973	4.02	370091	5.07	202663	6.59	319669
MC21696-1	90448	4.02	335220	5.06	181073	6.59	280140
ZZZZZZ	101568	4.02	372832	5.07	206610	6.59	316457
ZZZZZZ	90558	4.02	336688	5.06	184055	6.59	285740
ZZZZZZ	107622	4.02	404375	5.06	223153	6.59	347516
ZZZZZZ	97658	4.02	359755	5.07	204536	6.60	307787
ZZZZZZ	79148	4.02	298196	5.07	166834	6.59	267558
ZZZZZZ	90947	4.02	333457	5.07	180201	6.59	283190
ZZZZZZ	100715	4.02	369879	5.07	198270	6.59	311011
ZZZZZZ	101477	4.02	368535	5.07	199171	6.59	312878
ZZZZZZ	96608	4.02	359857	5.07	200311	6.59	336132
ZZZZZZ	81455	4.02	304277	5.07	170342	6.59	287408
ZZZZZZ	99581	4.02	368856	5.07	198655	6.60	313166
ZZZZZZ	99098	4.02	359226	5.07	193500	6.59	306844
ZZZZZZ	93171	4.02	348197	5.07	192667	6.59	316347
ZZZZZZ	88826	4.02	325129	5.07	180958	6.60	300385
ZZZZZZ	93672	4.02	351618	5.07	189012	6.60	302590
ZZZZZZ	92437	4.02	341448	5.07	186708	6.59	298277

IS 1 = 1,4-Dichlorobenzene-d4

IS 2 = Naphthalene-d8

IS 3 = Acenaphthene-D10

IS 4 = Phenanthrene-d10

IS 5 = Chrysene-d12

9.5.2
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Semivolatile Internal Standard Area Summary

Page 2 of 2

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSR1149-CC1128	Injection Date:	06/19/13
Lab File ID:	R31572.D	Injection Time:	17:51
Instrument ID:	GCMSR	Method:	SW846 8270C

Lab Sample ID	IS 1 AREA	IS 2 RT	IS 3 AREA	IS 4 RT	IS 5 AREA	IS 6 RT	IS 6 AREA	IS 6 RT
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IS 6 = Perylene-d12

- (a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

9.5.2
9

Semivolatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8270C

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
JB39439-1	R31578.D	46.0	61.0	83.0
JB39439-2	R31579.D	67.0	79.0	91.0
JB39439-3	R31580.D	61.0	76.0	87.0
JB39439-4	R31581.D	65.0	76.0	79.0
OP33636-BS	R31556.D	61.0	75.0	86.0
OP33636-MB	R31555.D	53.0	64.0	75.0
OP33636-MS	R31557.D	70.0	78.0	88.0
OP33636-MSD	R31558.D	69.0	77.0	85.0

Surrogate Compounds	Recovery Limits
S1 = Nitrobenzene-d5	30-130%
S2 = 2-Fluorobiphenyl	30-130%
S3 = Terphenyl-d14	30-130%

S1 = Nitrobenzene-d5
S2 = 2-Fluorobiphenyl
S3 = Terphenyl-d14

9.6.1
9

Initial Calibration Summary

Page 1 of 3

Job Number: JB39439

Sample: MSR1128-ICC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30970.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSR

Method : C:\msdchem\1\met...\\R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Thu May 30 14:53:36 2013
 Response via : Initial Calibration

Calibration Files

160 =R30977.D	120 =R30976.D	80 =R30975.D	20 =R30974.D
5 =R30972.D	2 =R30971.D	10 =R30973.D	50 =R30970.D

Compound	160	120	80	20	5	2	10	50	Avg	%RSD
<hr/>										
1) I 1,4-Dichlorobenzene-d						-----ISTD-----				
2) N-nitrosodim	0.804	0.758	0.796	0.844	0.808		0.825	0.807	0.806	3.31
3) Pyridine	1.452	1.367	1.453	1.536	1.436		1.445	1.492	1.455	3.57
4) Aniline		0.735	0.804	0.829	0.848	0.835	0.829	0.790	0.810	4.76
5) 2-Fluorophen	1.324	1.295	1.322	1.391	1.282	1.275	1.296	1.286	1.309	2.89
6) bis(2-Chloro	0.982	0.966	1.006	1.049	1.022	0.999	1.047	1.020	1.011	2.89
7) Phenol-d5	1.714	1.664	1.688	1.757	1.612	1.614	1.694	1.716	1.683	3.00
8) Phenol	1.887	1.832	1.742	1.759	1.693	1.635	1.723	1.772	1.755	4.47
9) 2-Chlorophen	1.458	1.415	1.465	1.483	1.452	1.412	1.447	1.467	1.450	1.73
10) 1,3-Dichloro	1.556	1.498	1.555	1.580	1.542	1.569	1.587	1.584	1.559	1.87
11) 1,4-Dichloro	1.635	1.591	1.644	1.626	1.646	1.608	1.671	1.649	1.634	1.53
12) 1,2-Dichloro	1.502	1.438	1.494	1.478	1.505	1.438	1.516	1.518	1.486	2.17
13) Benzyl alcoh	0.825	0.791	0.814	0.790	0.707		0.700	0.817	0.778	6.76
14) bis(2-chloro	1.514	1.494	1.576	1.570	1.678	1.607	1.642	1.653	1.592	4.13
15) o-cresol	1.242	1.206	1.256	1.271	1.272	1.127	1.318	1.324	1.252	5.07
16) Acetophenone	1.980	1.910	1.927	1.940	1.976	1.991	1.971	2.018	1.964	1.83
17) Hexachloroet	0.616	0.589	0.611	0.584	0.596	0.590	0.605	0.628	0.602	2.56
18) N-Nitroso-di	0.962	0.920	0.974	0.951	0.936	0.978	0.974	1.005	0.963	2.74
19) m+p-cresols	1.362	1.308	1.330	1.321	1.321	1.274	1.364	1.383	1.333	2.65
20) 4-methylphen	1.362	1.308	1.330	1.321	1.321	1.274	1.364	1.383	1.333	2.65
<hr/>										
21) I 1,4-Dichlorobenzene-d						-----ISTD-----				
22) Benzaldehyde	3.741	3.832	3.823	3.758			3.802	3.789	3.791	0.94
<hr/>										
23) I Naphthalene-d8						-----ISTD-----				
24) Nitrobenzene	0.394	0.392	0.400	0.405	0.388	0.399	0.411	0.397	0.398	1.83
25) Nitrobenzene	0.391	0.383	0.400	0.400	0.401	0.391	0.413	0.399	0.397	2.20
26) Isophorone	0.679	0.668	0.693	0.694	0.689	0.702	0.721	0.707	0.694	2.38
27) 2-Nitropheno	0.202	0.196	0.201	0.201	0.184		0.196	0.202	0.197	3.23
28) 2,4-Dimethyl	0.371	0.360	0.377	0.382	0.367		0.397	0.377	0.376	3.14
29) bis(2-Chloro	0.408	0.394	0.411	0.405	0.407		0.429	0.415	0.410	2.56
30) Benzoic acid	0.295	0.283	0.285	0.241			0.206	0.282	0.265	13.07
31) 2,4-Dichloro	0.319	0.306	0.314	0.315	0.305		0.311	0.322	0.313	2.05
32) 1,2,4-Trichl	0.336	0.327	0.337	0.343	0.341	0.350	0.353	0.337	0.341	2.40
33) Naphthalene	1.070	1.054	1.072	1.072	1.065	1.062	1.115	1.089	1.075	1.78
34) 2,6-Dichloro	0.311	0.302	0.312	0.311	0.309		0.317	0.315	0.311	1.62
35) 4-Chloroanil	0.456	0.441	0.457	0.453	0.443		0.472	0.465	0.455	2.41
36) Hexachlorobu	0.198	0.196	0.204	0.205	0.201	0.200	0.205	0.205	0.202	1.75
37) 4-Chloro-3-m	0.315	0.304	0.304	0.297	0.313		0.313	0.317	0.309	2.37
38) 2-Methylnaph	0.720	0.710	0.699	0.709	0.790	0.728	0.745	0.741	0.730	3.94
39) 1-Methylnaph	0.695	0.680	0.675	0.690	0.732	0.738	0.717	0.701	0.704	3.30
40) 1,2,4,5-Tetr	0.367	0.364	0.362	0.379	0.399	0.387	0.398	0.373	0.378	3.90
<hr/>										
41) I Naphthalene-d8a						-----ISTD-----				
42) Caprolactam	0.125	0.120	0.107	0.082			0.100	0.112	0.108	14.21

Initial Calibration Summary

Job Number: JB39439

Sample: MSR1128-ICC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30970.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

43)	I	Acenaphthene-d10	-----ISTD-----						
44)	Pentachloron	0.191 0.184 0.181 0.180		0.165	0.183	0.181	4.79		
45)	Hexachlorocyclo	0.389 0.373 0.375 0.356 0.317		0.353	0.388	0.364	6.90		
46)	2,4,6-Trichloro	0.416 0.399 0.387 0.406 0.393		0.413	0.422	0.405	3.14		
47)	2,4,5-Trichloro	0.450 0.423 0.403 0.412 0.405		0.428	0.450	0.424	4.62		
48)	2-Fluorobiphenyl	1.439 1.394 1.312 1.428 1.371	1.388	1.489	1.441	1.408	3.82		
49)	2-Chloronaphthalene	1.166 1.130 1.093 1.161 1.136	1.155	1.217	1.198	1.157	3.37		
50)	Acenaphthylene	1.884 1.832 1.799 1.906 1.905	1.814	1.966	1.931	1.880	3.15		
51)	Dimethylphthalate	1.387 1.331 1.293 1.363 1.362	1.350	1.422	1.414	1.365	3.13		
52)	2,4-Dinitrotoluene	0.413 0.396 0.418 0.400 0.374		0.400	0.426	0.404	4.24		
53)	Acenaphthene	1.234 1.208 1.247 1.248 1.269	1.233	1.307	1.267	1.252	2.37		
54)	2,4-Dinitrophenol	0.220 0.203 0.206 0.160			0.205	0.199	11.55		
55)	Dibenzofuran	1.707 1.654 1.737 1.731 1.744	1.675	1.758	1.760	1.721	2.26		
56)	2,6-Dinitrotoluene	0.323 0.307 0.305 0.306 0.284			0.307	0.329	0.309	4.68	
57)	4-Nitrophenoxy	0.281 0.255 0.272 0.267			0.248	0.271	0.266	4.51	
58)	2,3,4,6-Tetrahydrofuran	0.374 0.357 0.366 0.349 0.325			0.357	0.370	0.357	4.64	
59)	Fluorene	1.370 1.327 1.389 1.397 1.391	1.386	1.398	1.398	1.382	1.73		
60)	4-Chlorophenol	0.678 0.660 0.689 0.695 0.693	0.690	0.714	0.697	0.690	2.26		
61)	Diethylphthalate	1.311 1.269 1.335 1.333 1.362	1.301	1.388	1.345	1.330	2.78		
62)	2-nitroaniline	0.418 0.399 0.390 0.406 0.373	0.332	0.393	0.426	0.392	7.53		
63)	3-nitroaniline	0.347 0.334 0.336 0.346			0.351	0.359	0.346	2.62	
64)	4-nitroaniline	0.343 0.335 0.358 0.349			0.344	0.357	0.348	2.54	
65)	Acenaphthene-d10a	-----ISTD-----							
66)	1,1'-Biphenyl	1.451 1.416 1.397 1.441 1.351	1.414	1.411	1.412	2.29			
67)	I	Phenanthrene-d10	-----ISTD-----						
68)	4,6-Dinitrophenol	0.153 0.153 0.157 0.138		0.141	0.163	0.151	6.26		
69)	n-Nitrosodiphenylamine	0.548 0.560 0.572 0.587 0.569	0.559	0.674	0.604	0.584	6.90		
70)	1,2-Diphenylhydrazine	0.837 0.836 0.868 0.780 0.885	0.877	0.901	0.921	0.863	5.14		
71)	2,4,6-Tribromophenol	0.131 0.127 0.123 0.125 0.117		0.143	0.134	0.129	6.67		
72)	4-Bromophenol	0.240 0.229 0.239 0.244 0.232	0.253	0.272	0.248	0.245	5.52		
73)	Hexachlorobenzene	0.255 0.244 0.254 0.255 0.258	0.256	0.296	0.266	0.261	5.93		
74)	Pentachlorophenol	0.183 0.177 0.171 0.159		0.141	0.176	0.168	9.08		
75)	Phenanthrene	1.157 1.152 1.163 1.181 1.185	1.195	1.198	1.211	1.180	1.79		
76)	Anthracene	1.219 1.198 1.220 1.246 1.216	1.188	1.258	1.275	1.228	2.44		
77)	Carbazole	1.080 1.084 1.114 1.100 1.092	1.040	1.140	1.147	1.100	3.15		
78)	Di-n-butylphthalate	1.274 1.324 1.352 1.346 1.114		1.382	1.389	1.311	7.27		
79)	Fluoranthene	1.291 1.112 1.268 1.324 1.047	1.216	1.290	1.101	1.206	8.70		
80)	I	Phenanthrene-d10a	-----ISTD-----						
81)	Atrazine	0.199 0.198 0.184 0.158		0.178	0.195	0.185	8.40		
82)	I	Chrysene-d12	-----ISTD-----						
83)	Benzidine	0.531 0.586 0.497		0.522	0.491	0.525	7.17		
84)	Pyrene	1.207 1.117 1.471 1.469 1.233	1.405	1.265	1.277	1.306	9.91		
85)	Terphenyl-d1	0.846 0.787 1.010 0.990 0.825	0.965	0.893	0.892	0.901	8.99		
86)	3,3'-Dimethylbenzidine	0.594 0.629 0.646		0.660	0.601	0.626	4.53		
87)	Butylbenzylphthalate	0.493 0.461 0.603 0.519 0.516		0.531	0.538	0.523	8.37		
88)	3,3'-Dichlorobiphenyl	0.437 0.416 0.464 0.445 0.421		0.447	0.472	0.443	4.61		
89)	Benzo[a]anthracene	1.087 1.009 1.138 1.120 1.109	1.142	1.131	1.147	1.110	4.08		
90)	Chrysene	1.055 1.087 1.085 1.068 1.067	1.047	1.132	1.102	1.080	2.55		
91)	bis(2-Ethylhexyl)phthalate	0.760 0.776 0.750 0.739 0.718		0.864	0.774	0.769	6.06		
92)	I	Perylene-d12	-----ISTD-----						
93)	Di-n-octylphthalate	1.378 1.329 1.333 1.279 1.206		1.285	1.369	1.311	4.55		
94)	Benzo[b]fluoranthene	1.384 1.371 1.344 1.194 1.265	1.111	1.275	1.227	1.271	7.38		
95)	Benzo[k]fluoranthene	1.114 1.076 1.150 1.242 1.061	0.907	1.218	1.317	1.136	11.19		
96)	Benzo[a]pyrene	1.147 1.132 1.156 1.109 1.079	1.025	1.117	1.164	1.116	4.12		
97)	Indeno[1,2,3]perylene	1.205 1.314 1.399 1.559 1.472	1.195	1.304	1.633	1.385	11.54		

Initial Calibration Summary

Page 3 of 3

Job Number: JB39439

Sample: MSR1128-ICC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30970.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

98) Dibenz[a,h]a 0.987 1.065 1.133 1.262 1.171 0.901 1.041 1.317 1.110 12.55
99) Benzo[g,h,i] 0.955 1.061 1.140 1.282 1.210 0.889 1.095 1.325 1.120 13.57

(#) = Out of Range ### Number of calibration levels exceeded format ###

R130530_8270+.m

Fri May 31 12:37:32 2013

9.7.1

9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30978.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\R13030\R30978.D Vial: 8
 Acq On : 30 May 2013 11:35 am Operator: kristinr
 Sample : ICV1128-50 Inst : MSR
 Misc : op33100,msrl1128,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\met...R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Thu May 30 14:53:36 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	71	0.00	4.20
2	N-nitrosodimethylamine		-----NA-----				
3 T	Pyridine		-----NA-----				
4 T	Aniline		-----NA-----				
5 S	2-Fluorophenol	1.309	1.281	2.1	71	0.00	3.26
6 T	bis(2-Chloroethyl)ether		-----NA-----				
7 S	Phenol-d5	1.683	1.557	7.5	65	0.00	3.94
8 C	Phenol	1.755	1.681	4.2	68	0.00	3.95
9 M	2-Chlorophenol	1.450	1.408	2.9	68	0.00	4.07
10 T	1,3-Dichlorobenzene		-----NA-----				
11 C	1,4-Dichlorobenzene		-----NA-----				
12 T	1,2-Dichlorobenzene		-----NA-----				
13 T	Benzyl alcohol		-----NA-----				
14 T	bis(2-chloroisopropyl)eth		-----NA-----				
15 T	o-cresol	1.252	1.212	3.2	65	0.00	4.42
16 T	Acetophenone		-----NA-----				
17 T	Hexachloroethane		-----NA-----				
18 P	N-Nitroso-di-n-propylamin		-----NA-----				
19 T	m+p-cresols	1.333	1.298	2.6	67	0.00	4.54
20	4-methylphenol	1.333	1.298	2.6	67	0.00	4.54
21 I	1,4-Dichlorobenzene-d4A		-----NA-----				
22	Benzaldehyde		-----NA-----				
23 I	Naphthalene-d8	1.000	1.000	0.0	68	0.00	5.25
24 S	Nitrobenzene-d5		-----NA-----				
25 T	Nitrobenzene		-----NA-----				
26 T	Isophorone		-----NA-----				
27 C	2-Nitrophenol	0.197	0.194	1.5	66	0.00	4.95
28 T	2,4-Dimethylphenol	0.376	0.369	1.9	67	0.00	4.97
29 T	bis(2-Chloroethoxy)methan		-----NA-----				
30 T	Benzoic acid	0.265	0.288	-8.7	70	-0.02	5.06
31 C	2,4-Dichlorophenol	0.313	0.301	3.8	64	0.00	5.14
32 M	1,2,4-Trichlorobenzene		-----NA-----				
33 T	Naphthalene		-----NA-----				
34 T	2,6-Dichlorophenol	0.311	0.307	1.3	67	0.00	5.34
35 T	4-Chloroaniline		-----NA-----				
36 C	Hexachlorobutadiene		-----NA-----				
37 C	4-Chloro-3-methylphenol	0.309	0.302	2.3	65	0.00	5.75
38 T	2-Methylnaphthalene		-----NA-----				
39 T	1-Methylnaphthalene		-----NA-----				
40 T	1,2,4,5-Tetrachlorobenzen		-----NA-----				

9.7.2

9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30978.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

41	I	Naphthalene-d8a		-----	-NA-----				
42		Caprolactam		-----	-NA-----				
43	I	Acenaphthene-d10	1.000	1.000	0.0	65	0.00	6.79	
44	T	Pentachloronitrobenzene		-----	-NA-----				
45	P	Hexachlorocyclopentadiene		-----	-NA-----				
46	C	2,4,6-Trichlorophenol	0.405	0.409	-1.0	63	0.00	6.13	
47	T	2,4,5-Trichlorophenol	0.424	0.446	-5.2	65	0.00	6.17	
48	S	2-Fluorobiphenyl		-----	-NA-----				
49	T	2-Chloronaphthalene		-----	-NA-----				
50	M	Acenaphthylene		-----	-NA-----				
51	T	Dimethylphthalate		-----	-NA-----				
52	T	2,4-Dinitrotoluene		-----	-NA-----				
53	C	Acenaphthene		-----	-NA-----				
54	P	2,4-Dinitrophenol	0.199	0.167	16.1	53	0.00	6.85	
55	T	Dibenzofuran		-----	-NA-----				
56	M	2,6-Dinitrotoluene		-----	-NA-----				
57	P	4-Nitrophenol	0.266	0.267	-0.4	64	0.00	6.91	
58	T	2,3,4,6-Tetrachlorophenol		-----	-NA-----				
59	T	Fluorene		-----	-NA-----				
60	T	4-Chlorophenyl-phenylethane		-----	-NA-----				
61	T	Diethylphthalate		-----	-NA-----				
62	T	2-nitroaniline		-----	-NA-----				
63	T	3-nitroaniline		-----	-NA-----				
64	T	4-nitroaniline		-----	-NA-----				
65		Acenaphthene-d10a		-----	-NA-----				
66		1,1'-Biphenyl		-----	-NA-----				
67	I	Phenanthrene-d10	1.000	1.000	0.0	66	0.00	8.18	
68	T	4,6-Dinitro-2-methylpheno		-----	-NA-----				
69	C	n-Nitrosodiphenylamine		-----	-NA-----				
70	T	1,2-Diphenylhydrazine		-----	-NA-----				
71	S	2,4,6-Tribromophenol	0.129	0.116	10.1	57	0.00	7.52	
72	T	4-Bromophenyl-phenylether		-----	-NA-----				
73	T	Hexachlorobenzene		-----	-NA-----				
74	C	Pentachlorophenol	0.168	0.169	-0.6	64	0.00	8.06	
75	T	Phenanthrene		-----	-NA-----				
76	T	Anthracene		-----	-NA-----				
77	T	Carbazole		-----	-NA-----				
78	T	Di-n-butylphthalate		-----	-NA-----				
79	C	Fluoranthene		-----	-NA-----				
80	I	Phenanthrene-d10a		-----	-NA-----				
81		Atrazine		-----	-NA-----				
82	I	Chrysene-d12	1.000	1.000	0.0	73	0.00	11.14	
83	T	Benzidine		-----	-NA-----				
84	M	Pyrene		-----	-NA-----				
85	S	Terphenyl-d14		-----	-NA-----				
86		3,3-Dimethylbenzidine		-----	-NA-----				
87	T	Butylbenzylphthalate		-----	-NA-----				
88	T	3,3'-Dichlorobenzidine		-----	-NA-----				
89	T	Benzo[a]anthracene		-----	-NA-----				
90	T	Chrysene		-----	-NA-----				
91	T	bis(2-Ethylhexyl)phthalate		-----	-NA-----				
92	I	Perylene-d12	1.000	1.000	0.0	66	0.00	12.74	
93	C	Di-n-octylphthalate		-----	-NA-----				

9.7.2
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Initial Calibration Verification

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30978.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

94 T	Benzo[b]fluoranthene	-----NA-----
95 T	Benzo[k]fluoranthene	-----NA-----
96 C	Benzo[a]pyrene	-----NA-----
97 T	Indeno[1,2,3-cd]pyrene	-----NA-----
98 T	Dibenz[a,h]anthracene	-----NA-----
99 T	Benzo[g,h,i]perylene	-----NA-----

(#) = Out of Range
R30970.D R130530_8270+.mSPCC's out = 2 CCC's out = 7
Thu May 30 14:55:23 20139.7.2
9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30979.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\R13030\R30979.D Vial: 9
 Acq On : 30 May 2013 12:01 pm Operator: kristinr
 Sample : ICV1128-20 Inst : MSR
 Misc : op33100,msrl1128,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\met...\\R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Thu May 30 14:53:36 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	100	0.00
2 S	N-nitrosodimethylamine	0.806	0.898	-11.4	106	0.00
3 T	Pyridine	1.455	1.511	-3.8	98	0.01
4 T	Aniline			-----NA-----		
5 S	2-Fluorophenol			-----NA-----		
6 T	bis(2-Chloroethyl)ether	1.011	1.026	-1.5	97	0.00
7 S	Phenol-d5			-----NA-----		
8 C	Phenol			-----NA-----		
9 M	2-Chlorophenol			-----NA-----		
10 T	1,3-Dichlorobenzene	1.559	1.624	-4.2	102	0.00
11 C	1,4-Dichlorobenzene	1.634	1.687	-3.2	103	0.00
12 T	1,2-Dichlorobenzene	1.486	1.556	-4.7	105	0.00
13 T	Benzyl alcohol	0.778	0.749	3.7	94	0.00
14 T	bis(2-chloroisopropyl)eth	1.592	1.942	-22.0#	123	0.00
15 T	o-cresol			-----NA-----		
16 T	Acetophenone	1.964	1.890	3.8	97	0.00
17 T	Hexachloroethane	0.602	0.647	-7.5	110	0.00
18 P	N-Nitroso-di-n-propylamin	0.963	1.003	-4.2	105	-0.01
19 T	m+p-cresols			-----NA-----		
20	4-methylphenol			-----NA-----		
21 I	1,4-Dichlorobenzene-d4A			-----NA-----		
22	Benzaldehyde			-----NA-----		
23 I	Naphthalene-d8	1.000	1.000	0.0	103	0.00
24 S	Nitrobenzene-d5	0.398	0.385	3.3	97	0.00
25 T	Nitrobenzene	0.397	0.392	1.3	100	0.00
26 T	Isophorone	0.694	0.673	3.0	99	0.00
27 C	2-Nitrophenol			-----NA-----		
28 T	2,4-Dimethylphenol			-----NA-----		
29 T	bis(2-Chloroethoxy)methan	0.410	0.414	-1.0	105	0.00
30 T	Benzoic acid			-----NA-----		
31 C	2,4-Dichlorophenol			-----NA-----		
32 M	1,2,4-Trichlorobenzene	0.341	0.357	-4.7	107	0.00
33 T	Naphthalene	1.075	1.106	-2.9	106	0.00
34 T	2,6-Dichlorophenol			-----NA-----		
35 T	4-Chloroaniline			-----NA-----		
36 C	Hexachlorobutadiene	0.202	0.218	-7.9	109	0.00
37 C	4-Chloro-3-methylphenol			-----NA-----		
38 T	2-Methylnaphthalene	0.730	0.710	2.7	103	0.00
39 T	1-Methylnaphthalene	0.704	0.695	1.3	103	0.00
40 T	1,2,4,5-Tetrachlorobenzen	0.378	0.376	0.5	102	0.00

9.7.3

9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30979.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

41	I	Naphthalene-d8a		-----NA-----			
42		Caprolactam		-----NA-----			
43	I	Acenaphthene-d10	1.000	1.000	0.0	102	0.00
44	T	Pentachloronitrobenzene	0.181	0.175	3.3	99	0.00
45	P	Hexachlorocyclopentadiene	0.364	0.196	46.2#	56	0.00
46	C	2,4,6-Trichlorophenol		-----NA-----			
47	T	2,4,5-Trichlorophenol		-----NA-----			
48	S	2-Fluorobiphenyl	1.408	1.459	-3.6	104	0.00
49	T	2-Chloronaphthalene	1.157	1.251	-8.1	110	0.00
50	M	Acenaphthylene	1.880	1.532	18.5	82	0.00
51	T	Dimethylphthalate	1.365	1.384	-1.4	104	0.00
52	T	2,4-Dinitrotoluene	0.404	0.397	1.7	101	0.00
53	C	Acenaphthene	1.252	1.312	-4.8	107	0.00
54	P	2,4-Dinitrophenol		-----NA-----			
55	T	Dibenzofuran	1.721	1.744	-1.3	103	0.00
56	M	2,6-Dinitrotoluene	0.309	0.308	0.3	103	0.00
57	P	4-Nitrophenol		-----NA-----			
58	T	2,3,4,6-Tetrachlorophenol		-----NA-----			
59	T	Fluorene	1.382	1.435	-3.8	105	0.00
60	T	4-Chlorophenyl-phenylethane	0.690	0.709	-2.8	104	0.00
61	T	Diethylphthalate	1.330	1.376	-3.5	105	0.00
62	T	2-nitroaniline	0.392	0.419	-6.9	105	0.00
63	T	3-nitroaniline	0.346	0.293	15.3	86	0.00
64	T	4-nitroaniline	0.348	0.317	8.9	93	-0.01
65		Acenaphthene-d10a		-----NA-----			
66		1,1'-Biphenyl		-----NA-----			
67	I	Phenanthrene-d10	1.000	1.000	0.0	101	0.00
68	T	4,6-Dinitro-2-methylpheno		-----NA-----			
69	C	n-Nitrosodiphenylamine	0.584	0.547	6.3	94	0.00
70	T	1,2-Diphenylhydrazine	0.863	0.788	8.7	102	0.00
71	S	2,4,6-Tribromophenol		-----NA-----			
72	T	4-Bromophenyl-phenylether	0.245	0.238	2.9	98	0.00
73	T	Hexachlorobenzene	0.261	0.267	-2.3	106	0.00
74	C	Pentachlorophenol		-----NA-----			
75	T	Phenanthrene	1.180	1.220	-3.4	104	0.00
76	T	Anthracene	1.228	1.220	0.7	99	0.00
77	T	Carbazole	1.100	1.114	-1.3	102	0.00
78	T	Di-n-butylphthalate	1.311	1.276	2.7	96	0.00
79	C	Fluoranthene	1.206	1.303	-8.0	99	0.00
80	I	Phenanthrene-d10a		-----NA-----			
81		Atrazine		-----NA-----			
82	I	Chrysene-d12	1.000	1.000	0.0	96	0.00
83	T	Benzidine		-----NA-----			
84	M	Pyrene	1.306	1.386	-6.1	91	0.00
85	S	Terphenyl-d14	0.901	0.846	6.1	82	0.00
86		3,3-Dimethylbenzidine		-----NA-----			
87	T	Butylbenzylphthalate	0.523	0.529	-1.1	98	0.00
88	T	3,3'-Dichlorobenzidine		-----NA-----			
89	T	Benzo[a]anthracene	1.110	1.189	-7.1	102	0.00
90	T	Chrysene	1.080	1.107	-2.5	99	0.00
91	T	bis(2-Ethylhexyl)phthalat	0.769	0.752	2.2	98	0.00
92	I	Perylene-d12	1.000	1.000	0.0	109	0.00
93	C	Di-n-octylphthalate	1.311	1.188	9.4	101	0.00

9.7.3
9

Initial Calibration Verification

Page 3 of 3

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30979.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

94 T	Benzo[b]fluoranthene	1.271	1.048	17.5	96	-0.01	12.34
95 T	Benzo[k]fluoranthene	1.136	1.143	-0.6	100	0.00	12.37
96 C	Benzo[a]pyrene	1.116	1.051	5.8	103	0.00	12.68
97 T	Indeno[1,2,3-cd]pyrene	1.385	1.431	-3.3	100	-0.01	13.87
98 T	Dibenz[a,h]anthracene	1.110	1.176	-5.9	102	-0.01	13.88
99 T	Benzo[g,h,i]perylene	1.120	1.200	-7.1	102	-0.01	14.18

(#) = Out of Range
R30974.D R130530_8270+.m

SPCC's out = 2 CCC's out = 6
Fri May 31 12:35:15 2013

9.7.3
9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30980.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\R13030\R30980.D Vial: 10
 Acq On : 30 May 2013 12:24 pm Operator: kristinr
 Sample : ICV1128-20 Inst : MSR
 Misc : op33100,msrl1128,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\met...\\R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Thu May 30 14:53:36 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	93	0.00	4.20
2	N-nitrosodimethylamine		-----NA-----				
3 T	Pyridine		-----NA-----				
4 T	Aniline	0.810	0.756	6.7	85	0.00	3.98
5 S	2-Fluorophenol		-----NA-----				
6 T	bis(2-Chloroethyl)ether		-----NA-----				
7 S	Phenol-d5		-----NA-----				
8 C	Phenol		-----NA-----				
9 M	2-Chlorophenol		-----NA-----				
10 T	1,3-Dichlorobenzene		-----NA-----				
11 C	1,4-Dichlorobenzene		-----NA-----				
12 T	1,2-Dichlorobenzene		-----NA-----				
13 T	Benzyl alcohol		-----NA-----				
14 T	bis(2-chloroisopropyl)eth		-----NA-----				
15 T	o-cresol		-----NA-----				
16 T	Acetophenone		-----NA-----				
17 T	Hexachloroethane		-----NA-----				
18 P	N-Nitroso-di-n-propylamin		-----NA-----				
19 T	m+p-cresols		-----NA-----				
20	4-methylphenol		-----NA-----				
21 I	1,4-Dichlorobenzene-d4A	1.000	1.000	0.0	61	-0.07	4.20
22	Benzaldehyde		-----NA-----				
23 I	Naphthalene-d8	1.000	1.000	0.0	94	0.00	5.25
24 S	Nitrobenzene-d5		-----NA-----				
25 T	Nitrobenzene		-----NA-----				
26 T	Isophorone		-----NA-----				
27 C	2-Nitrophenol		-----NA-----				
28 T	2,4-Dimethylphenol		-----NA-----				
29 T	bis(2-Chloroethoxy)methan		-----NA-----				
30 T	Benzoic acid		-----NA-----				
31 C	2,4-Dichlorophenol		-----NA-----				
32 M	1,2,4-Trichlorobenzene		-----NA-----				
33 T	Naphthalene		-----NA-----				
34 T	2,6-Dichlorophenol		-----NA-----				
35 T	4-Chloroaniline	0.455	0.417	8.4	86	0.00	5.34
36 C	Hexachlorobutadiene		-----NA-----				
37 C	4-Chloro-3-methylphenol		-----NA-----				
38 T	2-Methylnaphthalene		-----NA-----				
39 T	1-Methylnaphthalene		-----NA-----				
40 T	1,2,4,5-Tetrachlorobenzen		-----NA-----				

9.7.4

9

Initial Calibration Verification

Page 2 of 3

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30980.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

41 I	Naphthalene-d8a	1.000	1.000	0.0	60	-0.07	5.25
42	Caprolactam		-----NA-----				
43 I	Acenaphthene-d10	1.000	1.000	0.0	89	0.00	6.79
44 T	Pentachloronitrobenzene		-----NA-----				
45 P	Hexachlorocyclopentadiene		-----NA-----				
46 C	2,4,6-Trichlorophenol		-----NA-----				
47 T	2,4,5-Trichlorophenol		-----NA-----				
48 S	2-Fluorobiphenyl		-----NA-----				
49 T	2-Chloronaphthalene		-----NA-----				
50 M	Acenaphthylene		-----NA-----				
51 T	Dimethylphthalate		-----NA-----				
52 T	2,4-Dinitrotoluene		-----NA-----				
53 C	Acenaphthene		-----NA-----				
54 P	2,4-Dinitrophenol		-----NA-----				
55 T	Dibenzofuran		-----NA-----				
56 M	2,6-Dinitrotoluene		-----NA-----				
57 P	4-Nitrophenol		-----NA-----				
58 T	2,3,4,6-Tetrachlorophenol		-----NA-----				
59 T	Fluorene		-----NA-----				
60 T	4-Chlorophenyl-phenylethane		-----NA-----				
61 T	Diethylphthalate		-----NA-----				
62 T	2-nitroaniline		-----NA-----				
63 T	3-nitroaniline		-----NA-----				
64 T	4-nitroaniline		-----NA-----				
65	Acenaphthene-d10a	1.000	1.000	0.0	56	-0.07	6.79
66	1,1'-Biphenyl		-----NA-----				
67 I	Phenanthrene-d10	1.000	1.000	0.0	94	0.00	8.18
68 T	4,6-Dinitro-2-methylpheno		-----NA-----				
69 C	n-Nitrosodiphenylamine		-----NA-----				
70 T	1,2-Diphenylhydrazine		-----NA-----				
71 S	2,4,6-Tribromophenol		-----NA-----				
72 T	4-Bromophenyl-phenylether		-----NA-----				
73 T	Hexachlorobenzene		-----NA-----				
74 C	Pentachlorophenol		-----NA-----				
75 T	Phenanthrene		-----NA-----				
76 T	Anthracene		-----NA-----				
77 T	Carbazole		-----NA-----				
78 T	Di-n-butylphthalate		-----NA-----				
79 C	Fluoranthene		-----NA-----				
80 I	Phenanthrene-d10a	1.000	1.000	0.0	58	-0.08	8.18
81	Atrazine		-----NA-----				
82 I	Chrysene-d12	1.000	1.000	0.0	90	0.00	11.14
83 T	Benzidine	0.525	0.712	-35.6#	110	0.00	9.64
84 M	Pyrene		-----NA-----				
85 S	Terphenyl-d14		-----NA-----				
86	3,3-Dimethylbenzidine		-----NA-----				
87 T	Butylbenzylphthalate		-----NA-----				
88 T	3,3'-Dichlorobenzidine	0.443	0.420	5.2	85	0.00	11.12
89 T	Benzo[a]anthracene		-----NA-----				
90 T	Chrysene		-----NA-----				
91 T	bis(2-Ethylhexyl)phthalate		-----NA-----				
92 I	Perylene-d12	1.000	1.000	0.0	111	0.00	12.74
93 C	Di-n-octylphthalate		-----NA-----				

9.7.4
9

Initial Calibration Verification

Page 3 of 3

Job Number: JB39439

Sample: MSR1128-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R30980.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

94 T	Benzo[b]fluoranthene	-----NA-----
95 T	Benzo[k]fluoranthene	-----NA-----
96 C	Benzo[a]pyrene	-----NA-----
97 T	Indeno[1,2,3-cd]pyrene	-----NA-----
98 T	Dibenz[a,h]anthracene	-----NA-----
99 T	Benzo[g,h,i]perylene	-----NA-----

(#) = Out of Range
R30974.D R130530_8270+.m

SPCC's out = 4 CCC's out = 13
Fri May 31 12:37:23 2013

9.7.4
9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1146-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31498.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\R130618\R31498.D Vial: 100
 Acq On : 18 Jun 2013 9:30 am Operator: kristinr
 Sample : icv1128-50 Inst : MSR
 Misc : op33604,msrl1146,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\met...\\R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Tue Jun 25 14:19:44 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	61	0.06	4.03
2	N-nitrosodimethylamine		-----	NA			
3 T	Pyridine		-----	NA			
4 T	Aniline		-----	NA			
5 S	2-Fluorophenol		-----	NA			
6 T	bis(2-Chloroethyl)ether		-----	NA			
7 S	Phenol-d5		-----	NA			
8 C	Phenol		-----	NA			
9 M	2-Chlorophenol		-----	NA			
10 T	1,3-Dichlorobenzene		-----	NA			
11 C	1,4-Dichlorobenzene		-----	NA			
12 T	1,2-Dichlorobenzene		-----	NA			
13 T	Benzyl alcohol		-----	NA			
14 T	bis(2-chloroisopropyl)eth		-----	NA			
15 T	o-cresol		-----	NA			
16 T	Acetophenone		-----	NA			
17 T	Hexachloroethane		-----	NA			
18 P	N-Nitroso-di-n-propylamin		-----	NA			
19 T	m+p-cresols		-----	NA			
20	4-methylphenol		-----	NA			
21 I	1,4-Dichlorobenzene-d4A	1.000	1.000	0.0	73	0.06	4.03
22	Benzaldehyde		-----	NA			
23 I	Naphthalene-d8	1.000	1.000	0.0	60	0.06	5.08
24 S	Nitrobenzene-d5		-----	NA			
25 T	Nitrobenzene		-----	NA			
26 T	Isophorone		-----	NA			
27 C	2-Nitrophenol		-----	NA			
28 T	2,4-Dimethylphenol		-----	NA			
29 T	bis(2-Chloroethoxy)methan		-----	NA			
30 T	Benzoic acid		-----	NA			
31 C	2,4-Dichlorophenol		-----	NA			
32 M	1,2,4-Trichlorobenzene		-----	NA			
33 T	Naphthalene		-----	NA			
34 T	2,6-Dichlorophenol		-----	NA			
35 T	4-Chloroaniline		-----	NA			
36 C	Hexachlorobutadiene		-----	NA			
37 C	4-Chloro-3-methylphenol		-----	NA			
38 T	2-Methylnaphthalene		-----	NA			
39 T	1-Methylnaphthalene		-----	NA			
40 T	1,2,4,5-Tetrachlorobenzen		-----	NA			

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1146-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31498.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

41	I	Naphthalene-d8a	1.000	1.000	0.0	77	0.06	5.08
42		Caprolactam		-----NA-----				
43	I	Acenaphthene-d10	1.000	1.000	0.0	60	0.06	6.60
44	T	Pentachloronitrobenzene		-----NA-----				
45	P	Hexachlorocyclopentadiene		-----NA-----				
46	C	2,4,6-Trichlorophenol		-----NA-----				
47	T	2,4,5-Trichlorophenol		-----NA-----				
48	S	2-Fluorobiphenyl		-----NA-----				
49	T	2-Chloronaphthalene		-----NA-----				
50	M	Acenaphthylene		-----NA-----				
51	T	Dimethylphthalate		-----NA-----				
52	T	2,4-Dinitrotoluene		-----NA-----				
53	C	Acenaphthene		-----NA-----				
54	P	2,4-Dinitrophenol		-----NA-----				
55	T	Dibenzofuran		-----NA-----				
56	M	2,6-Dinitrotoluene		-----NA-----				
57	P	4-Nitrophenol		-----NA-----				
58	T	2,3,4,6-Tetrachlorophenol		-----NA-----				
59	T	Fluorene		-----NA-----				
60	T	4-Chlorophenyl-phenylethane		-----NA-----				
61	T	Diethylphthalate		-----NA-----				
62	T	2-nitroaniline		-----NA-----				
63	T	3-nitroaniline		-----NA-----				
64	T	4-nitroaniline		-----NA-----				
65		Acenaphthene-d10a	1.000	1.000	0.0	75	0.06	6.60
66		1,1'-Biphenyl		-----NA-----				
67	I	Phenanthrene-d10	1.000	1.000	0.0	63	0.06	7.97
68	T	4,6-Dinitro-2-methylpheno		-----NA-----				
69	C	n-Nitrosodiphenylamine		-----NA-----				
70	T	1,2-Diphenylhydrazine		-----NA-----				
71	S	2,4,6-Tribromophenol		-----NA-----				
72	T	4-Bromophenyl-phenylether		-----NA-----				
73	T	Hexachlorobenzene		-----NA-----				
74	C	Pentachlorophenol		-----NA-----				
75	T	Phenanthrene		-----NA-----				
76	T	Anthracene		-----NA-----				
77	T	Carbazole		-----NA-----				
78	T	Di-n-butylphthalate		-----NA-----				
79	C	Fluoranthene		-----NA-----				
80	I	Phenanthrene-d10a	1.000	1.000	0.0	76	0.06	7.97
81		Atrazine		-----NA-----				
82	I	Chrysene-d12	1.000	1.000	0.0	76	0.08	10.91
83	T	Benzidine		-----NA-----				
84	M	Pyrene		-----NA-----				
85	S	Terphenyl-d14		-----NA-----				
86		3,3-Dimethylbenzidine	0.626	0.745	-19.0	95	0.08	10.27
87	T	Butylbenzylphthalate		-----NA-----				
88	T	3,3'-Dichlorobenzidine		-----NA-----				
89	T	Benzo[a]anthracene		-----NA-----				
90	T	Chrysene		-----NA-----				
91	T	bis(2-Ethylhexyl)phthalate		-----NA-----				
92	I	Perylene-d12	1.000	1.000	0.0	81	0.07	12.50
93	C	Di-n-octylphthalate		-----NA-----				

9.7.5
9

Initial Calibration Verification

Job Number: JB39439

Sample: MSR1146-ICV1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31498.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

94 T	Benzo[b]fluoranthene	-----	-NA-----				
95 T	Benzo[k]fluoranthene	-----	-NA-----				
96 C	Benzo[a]pyrene	-----	-NA-----				
97 T	Indeno[1,2,3-cd]pyrene	-----	-NA-----				
98 T	Dibenz[a,h]anthracene	-----	-NA-----				
99 T	Benzo[g,h,i]perylene	-----	-NA-----				
100	Naphthalene-d8b	1.000	1.000	0.0	57	0.08	5.08
101	o-Toluic Acid		-----	-NA-----			

	-----	Amount	Calc.	%Drift	-----
102	m-Toluic Acid		-----	-NA-----	
	-----	AvgRF	CCRF	%Dev	-----
103	p-Toluic Acid		-----	-NA-----	

(#= Out of Range

R31732.D R130530_8270+.m

SPCC's out = 4 CCC's out = 13

Thu Jun 27 19:00:28 2013

9.7.5
9

Continuing Calibration Summary

Page 1 of 3

Job Number: JB39439

Sample: MSR1148-CC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31552.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\R130619\R31552.D Vial: 100
 Acq On : 19 Jun 2013 8:17 am Operator: kristinr
 Sample : cc1128-80 Inst : MSR
 Misc : op33604,msr1148,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\met...\\R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Wed Jun 12 13:16:47 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.	
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	143	-0.19	
2	N-nitrosodimethylamine	0.806	0.734	8.9	132	-0.19	
3 T	Pyridine	1.455	1.327	8.8	130	-0.19	
4 T	Aniline	0.810	0.783	3.3	139	-0.19	
5 S	2-Fluorophenol	1.309	1.255	4.1	136	-0.18	
6 T	bis(2-Chloroethyl)ether	1.011	0.852	15.7	121	-0.19	
7 S	Phenol-d5	1.683	1.609	4.4	136	-0.16	
8 C	Phenol	1.755	1.753	0.1	144	-0.17	
9 M	2-Chlorophenol	1.450	1.435	1.0	140	-0.18	
10 T	1,3-Dichlorobenzene	1.559	1.511	3.1	139	-0.19	
11 C	1,4-Dichlorobenzene	1.634	1.589	2.8	138	-0.19	
12 T	1,2-Dichlorobenzene	1.486	1.444	2.8	138	-0.19	
13 T	Benzyl alcohol	0.778	0.764	1.8	134	-0.17	
14 T	bis(2-chloroisopropyl)eth	1.592	1.246	21.7#	113	-0.18	
15 T	o-cresol	1.252	1.230	1.8	140	-0.17	
16 T	Acetophenone	1.964	1.838	6.4	136	-0.19	
17 T	Hexachloroethane	0.602	0.560	7.0	131	-0.19	
18 P	N-Nitroso-di-n-propylamin	0.963	0.872	9.4	128	-0.18	
19 T	m+p-cresols	1.333	1.304	2.2	140	-0.17	
20	4-methylphenol	1.333	1.304	2.2	140	-0.17	
21 I	1,4-Dichlorobenzene-d4A	1.000	1.000	0.0	83	-0.25	
22	Benzaldehyde			-----NA-----			
23 I	Naphthalene-d8	1.000	1.000	0.0	148	-0.19	
24 S	Nitrobenzene-d5	0.398	0.354	11.1	131	-0.19	
25 T	Nitrobenzene	0.397	0.352	11.3	131	-0.18	
26 T	Isophorone	0.694	0.612	11.8	131	-0.19	
27 C	2-Nitrophenol	0.197	0.201	-2.0	148	-0.19	
28 T	2,4-Dimethylphenol	0.376	0.345	8.2	136	-0.17	
29 T	bis(2-Chloroethoxy)methan	0.410	0.382	6.8	138	-0.19	
30 T	Benzoic acid	0.265	0.269	-1.5	140	-0.15	
31 C	2,4-Dichlorophenol	0.313	0.311	0.6	147	-0.18	
32 M	1,2,4-Trichlorobenzene	0.341	0.334	2.1	147	-0.19	
33 T	Naphthalene	1.075	1.044	2.9	144	-0.19	
34 T	2,6-Dichlorophenol	0.311	0.305	1.9	145	-0.18	
35 T	4-Chloroaniline	0.455	0.450	1.1	146	-0.18	
36 C	Hexachlorobutadiene	0.202	0.192	5.0	139	-0.19	
37 C	4-Chloro-3-methylphenol	0.309	0.296	4.2	144	-0.17	
38 T	2-Methylnaphthalene	0.730	0.731	-0.1	155	-0.19	
39 T	1-Methylnaphthalene	0.704	0.677	3.8	149	-0.19	
40 T	1,2,4,5-Tetrachlorobenzen	0.378	0.362	4.2	148	-0.19	

9.7.6
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Continuing Calibration Summary

Page 2 of 3

Job Number: JB39439

Sample: MSR1148-CC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31552.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

41	I	Naphthalene-d8a	1.000	1.000	0.0	85	-0.26	5.07
42		Caprolactam			-----NA-----			
43	I	Acenaphthene-d10	1.000	1.000	0.0	148	-0.20	6.59
44	T	Pentachloronitrobenzene	0.181	0.162	10.5	132	-0.22	7.93
45	P	Hexachlorocyclopentadiene	0.364	0.312	14.3	123	-0.20	5.86
46	C	2,4,6-Trichlorophenol	0.405	0.393	3.0	150	-0.19	5.94
47	T	2,4,5-Trichlorophenol	0.424	0.419	1.2	154	-0.19	5.98
48	S	2-Fluorobiphenyl	1.408	1.360	3.4	153	-0.19	6.00
49	T	2-Chloronaphthalene	1.157	1.117	3.5	151	-0.19	6.09
50	M	Acenaphthylene	1.880	1.842	2.0	151	-0.19	6.46
51	T	Dimethylphthalate	1.365	1.326	2.9	152	-0.19	6.39
52	T	2,4-Dinitrotoluene	0.404	0.399	1.2	141	-0.19	6.81
53	C	Acenaphthene	1.252	1.178	5.9	140	-0.20	6.62
54	P	2,4-Dinitrophenol	0.199	0.202	-1.5	145	-0.19	6.67
55	T	Dibenzofuran	1.721	1.667	3.1	142	-0.20	6.76
56	M	2,6-Dinitrotoluene	0.309	0.310	-0.3	151	-0.19	6.46
57	P	4-Nitrophenol	0.266	0.225	15.4	122	-0.17	6.74
58	T	2,3,4,6-Tetrachlorophenol	0.357	0.364	-2.0	147	-0.20	6.91
59	T	Fluorene	1.382	1.343	2.8	143	-0.21	7.07
60	T	4-Chlorophenyl-phenylethane	0.690	0.670	2.9	144	-0.20	7.06
61	T	Diethylphthalate	1.330	1.242	6.6	138	-0.19	7.01
62	T	2-nitroaniline	0.392	0.391	0.3	148	-0.19	6.22
63	T	3-nitroaniline	0.346	0.333	3.8	147	-0.19	6.59
64	T	4-nitroaniline	0.348	0.330	5.2	136	-0.19	7.15
65		Acenaphthene-d10a	1.000	1.000	0.0	87	-0.27	6.59
66		1,1'-Biphenyl			-----NA-----			
67	I	Phenanthrene-d10	1.000	1.000	0.0	144	-0.22	7.96
68	T	4,6-Dinitro-2-methylpheno	0.151	0.160	-6.0	147	-0.19	7.18
69	C	n-Nitrosodiphenylamine	0.584	0.560	4.1	141	-0.20	7.19
70	T	1,2-Diphenylhydrazine	0.863	0.762	11.7	126	-0.20	7.21
71	S	2,4,6-Tribromophenol	0.129	0.130	-0.8	152	-0.21	7.31
72	T	4-Bromophenyl-phenylether	0.245	0.241	1.6	145	-0.21	7.52
73	T	Hexachlorobenzene	0.261	0.252	3.4	143	-0.22	7.67
74	C	Pentachlorophenol	0.168	0.162	3.6	137	-0.21	7.85
75	T	Phenanthrene	1.180	1.135	3.8	141	-0.22	7.99
76	T	Anthracene	1.228	1.183	3.7	140	-0.22	8.03
77	T	Carbazole	1.100	1.063	3.4	137	-0.22	8.21
78	T	Di-n-butylphthalate	1.311	1.320	-0.7	141	-0.22	8.61
79	C	Fluoranthene	1.206	1.256	-4.1	143	-0.24	9.25
80	I	Phenanthrene-d10a	1.000	1.000	0.0	84	-0.30	7.96
81		Atrazine			-----NA-----			
82	I	Chrysene-d12	1.000	1.000	0.0	172	-0.25	10.90
83	T	Benzidine	0.525	0.355	32.4#	115	-0.23	9.41
84	M	Pyrene	1.306	1.208	7.5	142	-0.24	9.50
85	S	Terphenyl-d14	0.901	0.861	4.4	147	-0.23	9.69
86		3,3-Dimethylbenzidine	0.626	0.434	30.7#	126	-0.23	10.26
87	T	Butylbenzylphthalate	0.523	0.499	4.6	143	-0.23	10.30
88	T	3,3'-Dichlorobenzidine	0.443	0.438	1.1	163	-0.24	10.89
89	T	Benzo[a]anthracene	1.110	1.076	3.1	163	-0.24	10.89
90	T	Chrysene	1.080	1.036	4.1	165	-0.24	10.94
91	T	bis(2-Ethylhexyl)phthalate	0.769	0.741	3.6	170	-0.23	10.99
92	I	Perylene-d12	1.000	1.000	0.0	175	-0.25	12.49
93	C	Di-n-octylphthalate	1.311	1.284	2.1	169	-0.23	11.67

9.7.6
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Continuing Calibration Summary

Page 3 of 3

Job Number: JB39439

Sample: MSR1148-CC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31552.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

94 T	Benzo[b]fluoranthene	1.271	1.248	1.8	163	-0.25	12.10
95 T	Benzo[k]fluoranthene	1.136	1.167	-2.7	178	-0.24	12.13
96 C	Benzo[a]pyrene	1.116	1.114	0.2	169	-0.25	12.43
97 T	Indeno[1,2,3-cd]pyrene	1.385	1.378	0.5	173	-0.32	13.57
98 T	Dibenz[a,h]anthracene	1.110	1.109	0.1	171	-0.31	13.58
99 T	Benzo[g,h,i]perylene	1.120	1.114	0.5	171	-0.34	13.86

(#) = Out of Range
R30975.D R130530_8270+.m

SPCC's out = 0 CCC's out = 0
Thu Jun 20 10:12:05 2013

9.7.6

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Continuing Calibration Summary

Page 1 of 3

Job Number: JB39439

Sample: MSR1149-CC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31572.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\R130619\R31572.D Vial: 100
 Acq On : 19 Jun 2013 5:51 pm Operator: kristinr
 Sample : cc1128-80 Inst : MSR
 Misc : op33604,msr1149,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : W:\1\methods\R130530_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Tue Jun 25 14:19:44 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.	
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	124	0.05	
2	N-nitrosodimethylamine	0.806	0.706	12.4	110	0.05	
3 T	Pyridine	1.455	1.293	11.1	111	0.04	
4 T	Aniline	0.810	0.712	12.1	110	0.03	
5 S	2-Fluorophenol	1.309	1.192	8.9	112	0.04	
6 T	bis(2-Chloroethyl)ether	1.011	0.828	18.1	102	0.05	
7 S	Phenol-d5	1.683	1.539	8.6	113	0.05	
8 C	Phenol	1.755	1.638	6.7	117	0.05	
9 M	2-Chlorophenol	1.450	1.320	9.0	112	0.05	
10 T	1,3-Dichlorobenzene	1.559	1.469	5.8	117	0.04	
11 C	1,4-Dichlorobenzene	1.634	1.559	4.6	118	0.04	
12 T	1,2-Dichlorobenzene	1.486	1.407	5.3	117	0.05	
13 T	Benzyl alcohol	0.778	0.473	39.2#	72	0.05	
14 T	bis(2-chloroisopropyl)eth	1.592	1.211	23.9#	95	0.04	
15 T	o-cresol	1.252	1.181	5.7	117	-0.08	
16 T	Acetophenone	1.964	1.767	10.0	114	0.05	
17 T	Hexachloroethane	0.602	0.546	9.3	111	0.05	
18 P	N-Nitroso-di-n-propylamin	0.963	0.826	14.2	105	0.05	
19 T	m+p-cresols	1.333	1.277	4.2	119	0.05	
20	4-methylphenol	1.333	1.277	4.2	119	0.05	
21 I	1,4-Dichlorobenzene-d4A	1.000	1.000	0.0	72	0.05	
22	Benzaldehyde			-----NA-----			
23 I	Naphthalene-d8	1.000	1.000	0.0	124	0.05	
24 S	Nitrobenzene-d5	0.398	0.361	9.3	111	0.05	
25 T	Nitrobenzene	0.397	0.347	12.6	107	0.05	
26 T	Isophorone	0.694	0.617	11.1	110	0.05	
27 C	2-Nitrophenol	0.197	0.192	2.5	118	0.05	
28 T	2,4-Dimethylphenol	0.376	0.340	9.6	111	0.05	
29 T	bis(2-Chloroethoxy)methan	0.410	0.376	8.3	113	0.05	
30 T	Benzoic acid	0.265	0.252	4.9	110	0.07	
31 C	2,4-Dichlorophenol	0.313	0.305	2.6	120	0.05	
32 M	1,2,4-Trichlorobenzene	0.341	0.330	3.2	121	0.05	
33 T	Naphthalene	1.075	1.055	1.9	122	0.05	
34 T	2,6-Dichlorophenol	0.311	0.291	6.4	115	0.05	
35 T	4-Chloroaniline	0.455	0.441	3.1	119	0.05	
36 C	Hexachlorobutadiene	0.202	0.201	0.5	122	0.05	
37 C	4-Chloro-3-methylphenol	0.309	0.285	7.8	116	0.05	
38 T	2-Methylnaphthalene	0.730	0.730	0.0	129	0.05	
39 T	1-Methylnaphthalene	0.704	0.699	0.7	128	0.05	
40 T	1,2,4,5-Tetrachlorobenzen	0.378	0.369	2.4	126	0.05	

97.7
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Continuing Calibration Summary

Page 2 of 3

Job Number: JB39439

Sample: MSR1149-CC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31572.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

41	I	Naphthalene-d8a	1.000	1.000	0.0	71	0.05	5.07
42		Caprolactam			-----NA-----			
43	I	Acenaphthene-d10	1.000	1.000	0.0	125	0.05	6.59
44	T	Pentachloronitrobenzene	0.181	0.166	8.3	115	0.06	7.93
45	P	Hexachlorocyclopentadiene	0.364	0.316	13.2	106	0.05	5.86
46	C	2,4,6-Trichlorophenol	0.405	0.365	9.9	118	0.05	5.94
47	T	2,4,5-Trichlorophenol	0.424	0.395	6.8	123	0.05	5.98
48	S	2-Fluorobiphenyl	1.408	1.357	3.6	130	0.05	6.00
49	T	2-Chloronaphthalene	1.157	1.094	5.4	126	0.05	6.09
50	M	Acenaphthylene	1.880	1.798	4.4	125	0.05	6.46
51	T	Dimethylphthalate	1.365	1.255	8.1	122	0.05	6.39
52	T	2,4-Dinitrotoluene	0.404	0.378	6.4	113	0.05	6.80
53	C	Acenaphthene	1.252	1.147	8.4	115	0.05	6.62
54	P	2,4-Dinitrophenol	0.199	0.190	4.5	116	0.05	6.67
55	T	Dibenzofuran	1.721	1.601	7.0	116	0.05	6.76
56	M	2,6-Dinitrotoluene	0.309	0.297	3.9	122	0.05	6.46
57	P	4-Nitrophenol	0.266	0.228	14.3	105	0.05	6.74
58	T	2,3,4,6-Tetrachlorophenol	0.357	0.338	5.3	116	0.05	6.92
59	T	Fluorene	1.382	1.299	6.0	117	0.05	7.07
60	T	4-Chlorophenyl-phenylethane	0.690	0.639	7.4	116	0.05	7.06
61	T	Diethylphthalate	1.330	1.211	8.9	114	0.05	7.02
62	T	2-nitroaniline	0.392	0.377	3.8	121	0.05	6.22
63	T	3-nitroaniline	0.346	0.322	6.9	120	0.05	6.59
64	T	4-nitroaniline	0.348	0.319	8.3	112	0.06	7.14
65		Acenaphthene-d10a	1.000	1.000	0.0	73	0.05	6.59
66		1,1'-Biphenyl			-----NA-----			
67	I	Phenanthrene-d10	1.000	1.000	0.0	120	0.05	7.96
68	T	4,6-Dinitro-2-methylpheno	0.151	0.152	-0.7	117	0.06	7.18
69	C	n-Nitrosodiphenylamine	0.584	0.556	4.8	117	0.05	7.19
70	T	1,2-Diphenylhydrazine	0.863	0.751	13.0	104	0.05	7.21
71	S	2,4,6-Tribromophenol	0.129	0.126	2.3	123	0.05	7.32
72	T	4-Bromophenyl-phenylether	0.245	0.233	4.9	117	0.05	7.51
73	T	Hexachlorobenzene	0.261	0.247	5.4	117	0.06	7.67
74	C	Pentachlorophenol	0.168	0.144	14.3	101	0.06	7.85
75	T	Phenanthrene	1.180	1.108	6.1	115	0.06	7.99
76	T	Anthracene	1.228	1.168	4.9	115	0.06	8.03
77	T	Carbazole	1.100	1.050	4.5	113	0.06	8.21
78	T	Di-n-butylphthalate	1.311	1.279	2.4	114	0.06	8.61
79	C	Fluoranthene	1.206	1.203	0.2	114	0.06	9.25
80	I	Phenanthrene-d10a	1.000	1.000	0.0	70	0.05	7.96
81		Atrazine			-----NA-----			
82	I	Chrysene-d12	1.000	1.000	0.0	142	0.06	10.90
83	T	Benzidine	0.525	0.477	9.1	128	0.06	9.41
84	M	Pyrene	1.306	1.171	10.3	113	0.06	9.50
85	S	Terphenyl-d14	0.901	0.873	3.1	123	0.06	9.69
86		3,3-Dimethylbenzidine	0.626	0.512	18.2	123	0.06	10.26
87	T	Butylbenzylphthalate	0.523	0.492	5.9	116	0.06	10.29
88	T	3,3'-Dichlorobenzidine	0.443	0.447	-0.9	137	0.06	10.89
89	T	Benzo[a]anthracene	1.110	1.055	5.0	132	0.06	10.88
90	T	Chrysene	1.080	1.033	4.4	136	0.06	10.93
91	T	bis(2-Ethylhexyl)phthalate	0.769	0.727	5.5	138	0.06	10.99
92	I	Perylene-d12	1.000	1.000	0.0	148	0.07	12.49
93	C	Di-n-octylphthalate	1.311	1.242	5.3	138	0.06	11.67

9.7.7
9

Continuing Calibration Summary

Page 3 of 3

Job Number: JB39439

Sample: MSR1149-CC1128

Account: ALNJ Accutest New Jersey

Lab FileID: R31572.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

94 T	Benzo[b]fluoranthene	1.271	1.233	3.0	136	0.07	12.10
95 T	Benzo[k]fluoranthene	1.136	1.117	1.7	144	0.07	12.12
96 C	Benzo[a]pyrene	1.116	1.086	2.7	139	0.07	12.43
97 T	Indeno[1,2,3-cd]pyrene	1.385	1.315	5.1	139	0.09	13.57
98 T	Dibenz[a,h]anthracene	1.110	1.049	5.5	137	0.08	13.57
99 T	Benzo[g,h,i]perylene	1.120	1.067	4.7	139	0.09	13.86
100	Naphthalene-d8b	1.000	1.000	0.0	96	0.06	5.07
101	o-Toluic Acid			-----NA-----			
		-----Amount	Calc.	%Drift			
102	m-Toluic Acid			-----NA-----			
		-----AvgRF	CCRF	%Dev			
103	p-Toluic Acid			-----NA-----			
		-----	-----	-----			

(#= Out of Range

R31733.D R130530_8270+.m

SPCC's out = 0 CCC's out = 0

Tue Jun 25 16:31:22 2013

9.7.7

9



GC/MS Semi-volatiles

Raw Data

(Accutest Labs of New England, Inc.)

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31578.D
 Acq On : 19 Jun 2013 8:09 pm
 Operator : kristinr
 Sample : jb39439-1
 Misc : op33636,msrl1149,20.68,,,1,1
 ALS Vial : 24 Sample Multiplier: 1

Quant Time: Jul 05 10:17:09 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.015	152	102148	40.00	ppm	0.05
21) 1,4-Dichlorobenzene-d4A	4.015	152	102148	40.00	PPM	0.05
23) Naphthalene-d8	5.062	136	382051	40.00	ppm	0.04
41) Naphthalene-d8a	5.062	136	382051	40.00	ppm	0.04
43) Acenaphthene-d10	6.591	164	215048	40.00	ppm	0.05
65) Acenaphthene-d10a	6.591	164	215048	40.00	ppm	0.05
67) Phenanthrene-d10	7.956	188	334274	40.00	ppm	0.05
80) Phenanthrene-d10a	7.956	188	334274	40.00	ppm	# 0.05
82) Chrysene-d12	10.897	240	329535	40.00	ppm	0.06
92) Perylene-d12	12.485	264	311098	40.00	ppm	0.06
100) Naphthalene-d8b	5.062	136	382051	40.00	ug/mL	# 0.06
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.092	112	80429	24.06	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery = 24.06%#			
7) Phenol-d5	3.768	99	106086	24.69	ppm	0.04
Spiked Amount 100.000	Range 30 - 130		Recovery = 24.69%#			
24) Nitrobenzene-d5	4.486	82	87349	22.96	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery = 45.92%			
48) 2-Fluorobiphenyl	5.997	172	231044	30.52	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery = 61.04%			
71) 2,4,6-Tribromophenol	7.315	330	41267	38.42	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery = 38.42%			
85) Terphenyl-d14	9.685	244	309383	41.69	ppm	0.06
Spiked Amount 50.000	Range 30 - 130		Recovery = 83.38%			
<hr/>						
Target Compounds				Qvalue		
<hr/>						

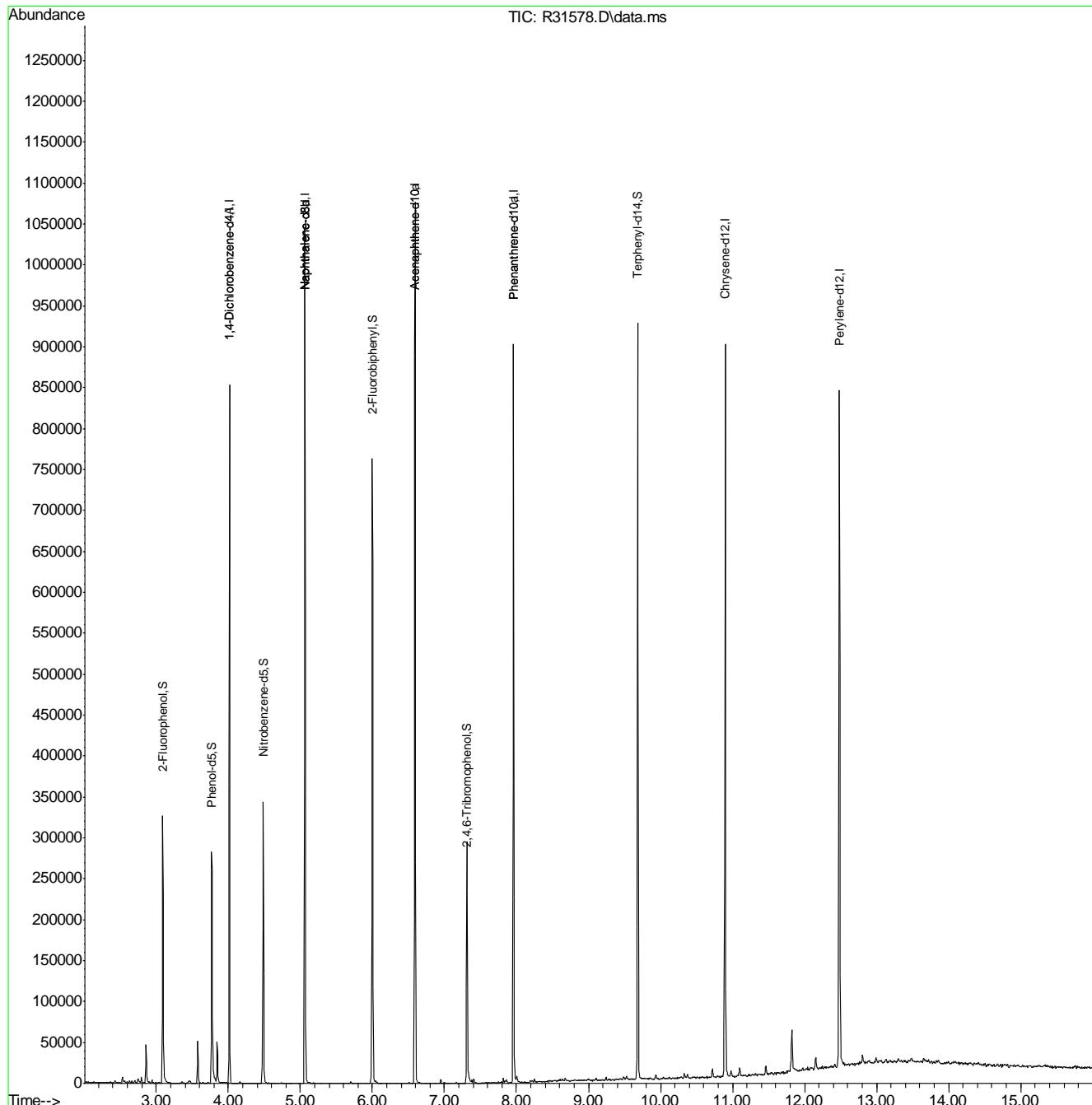
(#) = qualifier out of range (m) = manual integration (+) = signals summed

10.1.1
10

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31578.D
 Acq On : 19 Jun 2013 8:09 pm
 Operator : kristinr
 Sample : jb39439-1
 Misc : op33636,msrl1149,20.68,,,1,1
 ALS Vial : 24 Sample Multiplier: 1

Quant Time: Jul 05 10:17:09 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31579.D
 Acq On : 19 Jun 2013 8:32 pm
 Operator : kristinr
 Sample : jb39439-2
 Misc : op33636,msrl1149,20.28,,,1,1
 ALS Vial : 25 Sample Multiplier: 1

Quant Time: Jul 05 10:17:58 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration

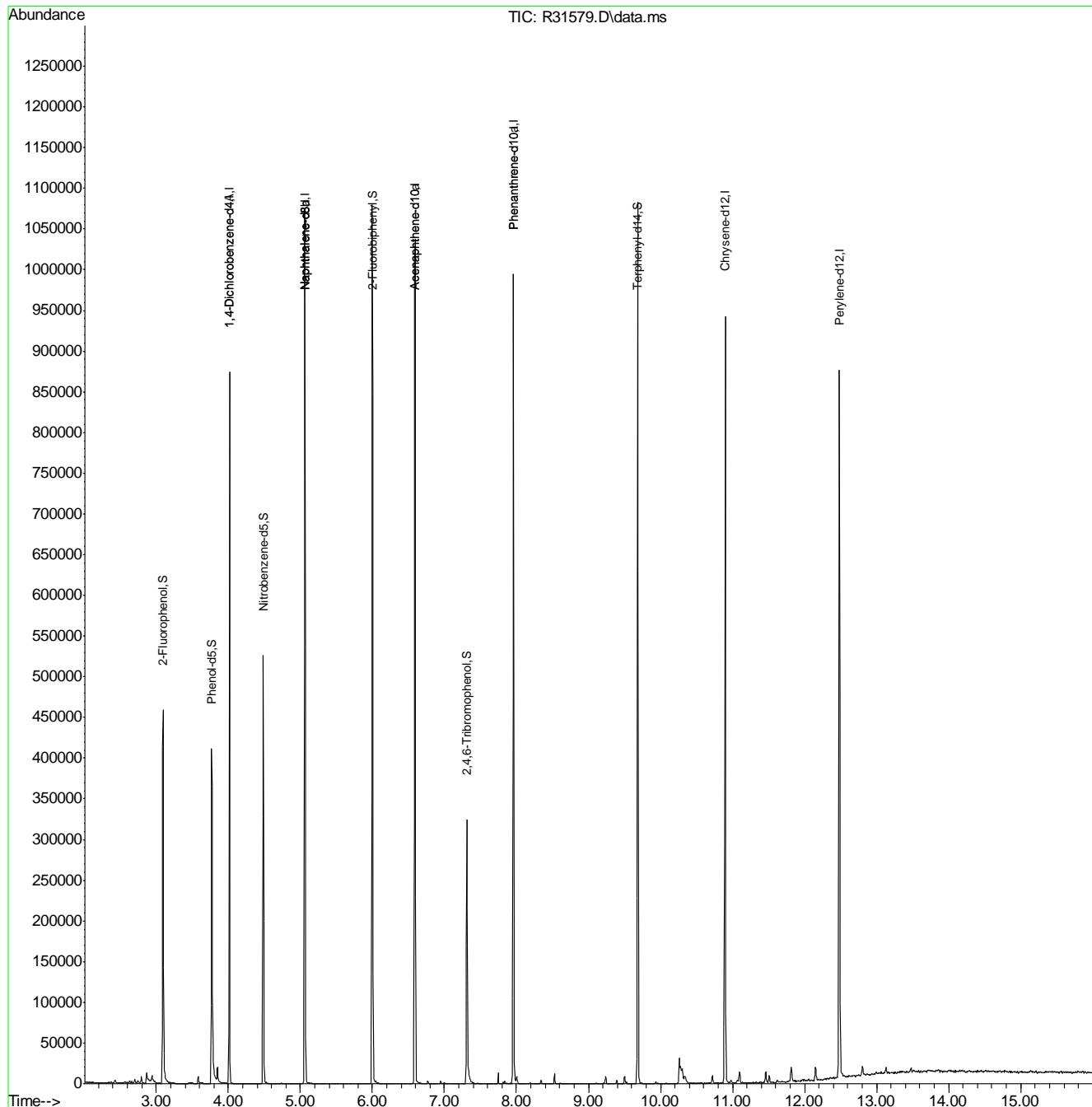
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.015	152	108790	40.00	ppm	0.05
21) 1,4-Dichlorobenzene-d4A	4.015	152	108790	40.00	PPM	0.05
23) Naphthalene-d8	5.062	136	412879	40.00	ppm	0.04
41) Naphthalene-d8a	5.062	136	412879	40.00	ppm	0.04
43) Acenaphthene-d10	6.591	164	234595	40.00	ppm	0.05
65) Acenaphthene-d10a	6.591	164	234595	40.00	ppm	0.05
67) Phenanthrene-d10	7.956	188	363567	40.00	ppm	0.05
80) Phenanthrene-d10a	7.956	188	363567	40.00	ppm	# 0.05
82) Chrysene-d12	10.897	240	356734	40.00	ppm	0.06
92) Perylene-d12	12.485	264	324283	40.00	ppm	0.06
100) Naphthalene-d8b	5.062	136	412879	40.00	ug/mL	# 0.06
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.098	112	127200	35.73	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery =	35.73%		
7) Phenol-d5	3.768	99	155252	33.93	ppm	0.04
Spiked Amount 100.000	Range 30 - 130		Recovery =	33.93%		
24) Nitrobenzene-d5	4.486	82	138371	33.65	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery =	67.30%		
48) 2-Fluorobiphenyl	5.997	172	326033	39.49	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery =	78.98%		
71) 2,4,6-Tribromophenol	7.309	330	47013	40.25	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery =	40.25%		
85) Terphenyl-d14	9.685	244	364740	45.40	ppm	0.06
Spiked Amount 50.000	Range 30 - 130		Recovery =	90.80%		
<hr/>						
Target Compounds				Qvalue		
<hr/>						

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31579.D
 Acq On : 19 Jun 2013 8:32 pm
 Operator : kristinr
 Sample : jb39439-2
 Misc : op33636,msrl1149,20.28,,,1,1
 ALS Vial : 25 Sample Multiplier: 1

Quant Time: Jul 05 10:17:58 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration



Doug Yargeau
 07/06/13 14:15

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31580.D
 Acq On : 19 Jun 2013 8:56 pm
 Operator : kristinr
 Sample : jb39439-3
 Misc : op33636,msrl1149,20.08,,,1,1
 ALS Vial : 26 Sample Multiplier: 1

Quant Time: Jul 05 10:19:30 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration

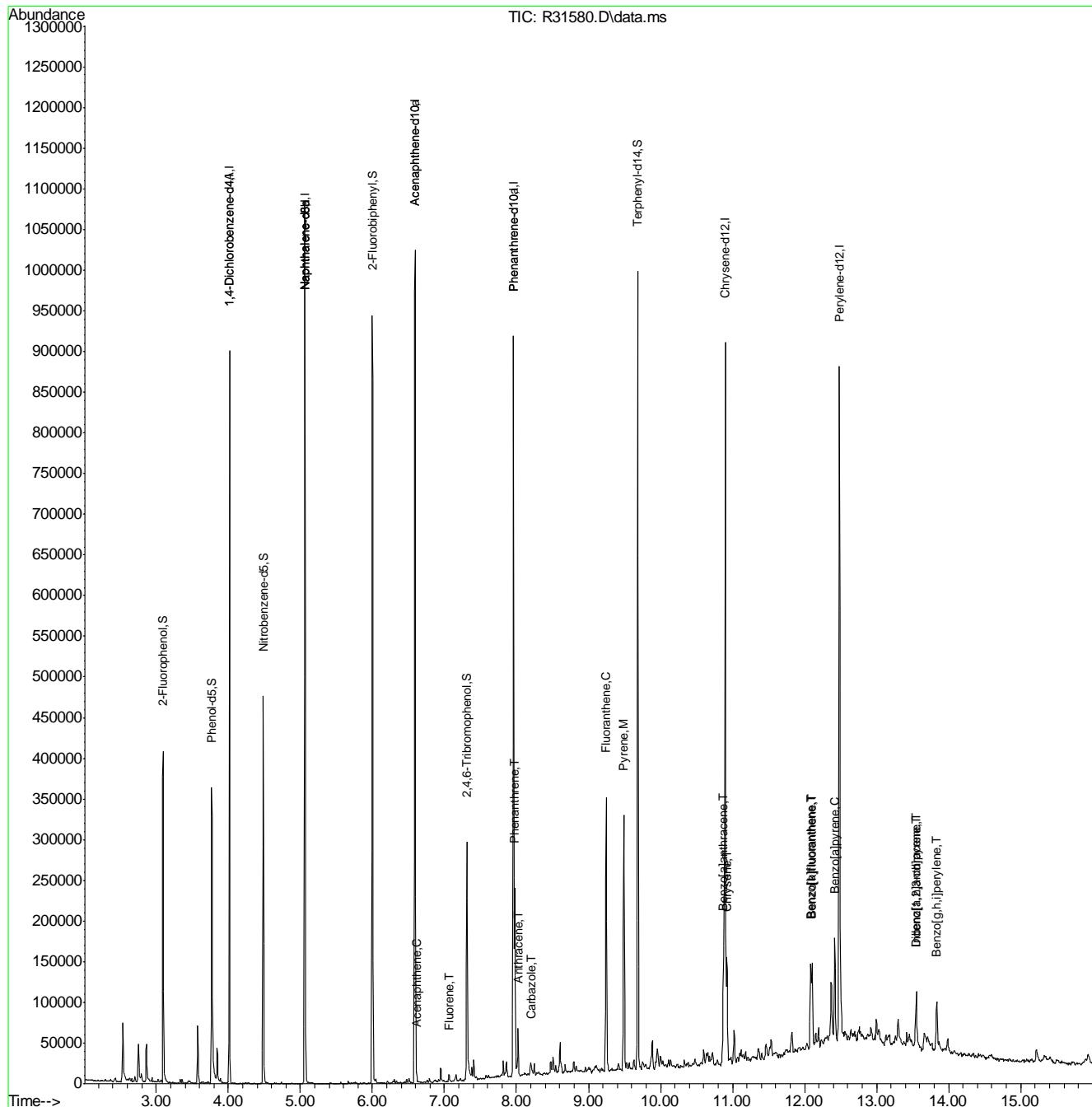
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.015	152	110059	40.00	ppm	0.05
21) 1,4-Dichlorobenzene-d4A	4.015	152	110059	40.00	PPM	0.05
23) Naphthalene-d8	5.062	136	405456	40.00	ppm	0.04
41) Naphthalene-d8a	5.062	136	405456	40.00	ppm	# 0.04
43) Acenaphthene-d10	6.591	164	221018	40.00	ppm	0.05
65) Acenaphthene-d10a	6.591	164	221018	40.00	ppm	0.05
67) Phenanthrene-d10	7.956	188	338369	40.00	ppm	0.05
80) Phenanthrene-d10a	7.956	188	338369	40.00	ppm	0.05
82) Chrysene-d12	10.897	240	324682	40.00	ppm	0.06
92) Perylene-d12	12.485	264	303830	40.00	ppm	0.06
100) Naphthalene-d8b	5.062	136	405456	40.00	ug/mL	# 0.06
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.098	112	109604	30.44	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery = 30.44%			
7) Phenol-d5	3.768	99	142545	30.79	ppm	0.04
Spiked Amount 100.000	Range 30 - 130		Recovery = 30.79%			
24) Nitrobenzene-d5	4.486	82	122709	30.39	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery = 60.78%			
48) 2-Fluorobiphenyl	5.997	172	296985	38.18	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery = 76.36%			
71) 2,4,6-Tribromophenol	7.309	330	44466	40.90	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery = 40.90%			
85) Terphenyl-d14	9.685	244	317607	43.43	ppm	0.06
Spiked Amount 50.000	Range 30 - 130		Recovery = 86.86%			
<hr/>						
Target Compounds				Qvalue		
53) Acenaphthene	6.615	153	2136	0.31	ppm	93
59) Fluorene	7.062	166	2436	0.32	ppm	91
75) Phenanthrene	7.980	178	78757	7.89	ppm	98
76) Anthracene	8.021	178	23421	2.26	ppm	98
77) Carbazole	8.203	167	6479	0.70	ppm	91
79) Fluoranthene	9.244	202	141525	13.87	ppm	98
84) Pyrene	9.491	202	115668	10.91	ppm	94
89) Benzo[a]anthracene	10.873	228	52934	5.87	ppm	96
90) Chrysene	10.921	228	52279	5.96	ppm	97
94) Benzo[b]fluoranthene	12.085	252	49356	5.11	ppm	98
95) Benzo[k]fluoranthene	12.103	252	33042m	3.83	ppm	
96) Benzo[a]pyrene	12.420	252	46878	5.53	ppm	97
97) Indeno[1,2,3-cd]pyrene	13.544	276	33884	3.22	ppm	87
98) Dibenz[a,h]anthracene	13.550	278	9750	1.16	ppm	86
99) Benzo[g,h,i]perylene	13.832	276	34398	4.04	ppm	97
<hr/>						

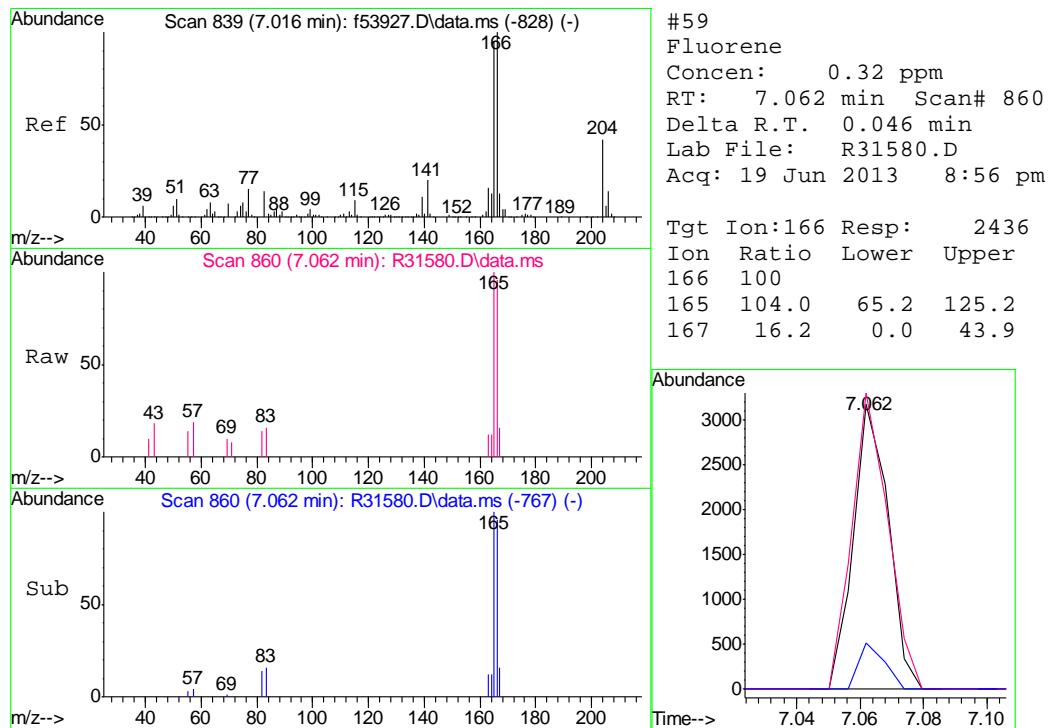
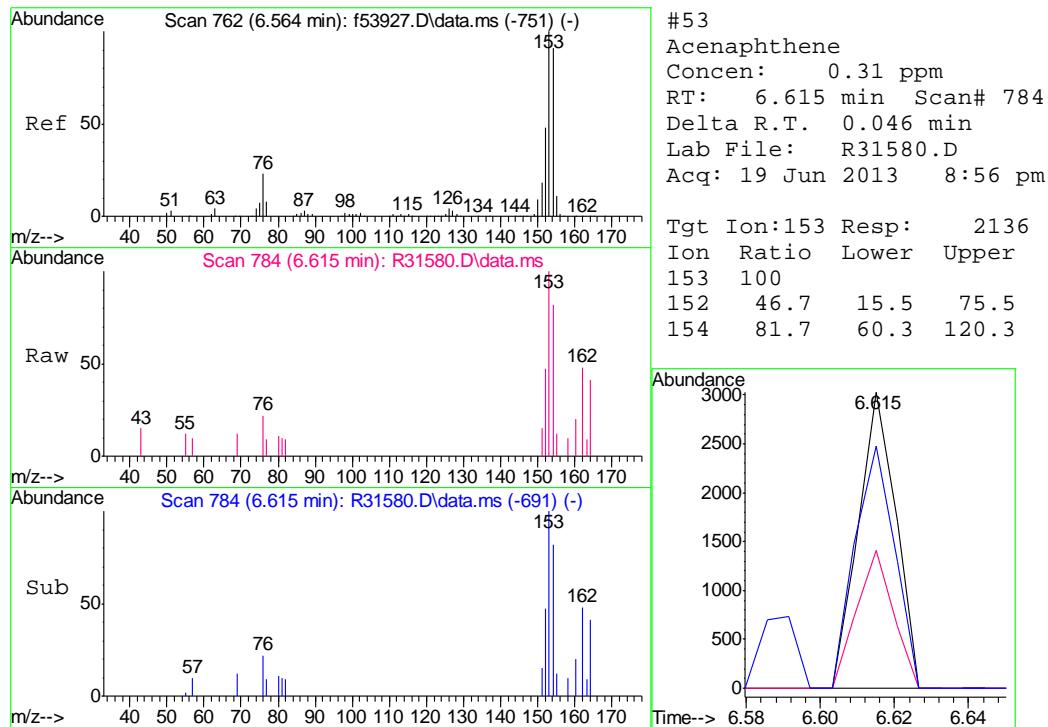
(#) = qualifier out of range (m) = manual integration (+) = signals summed

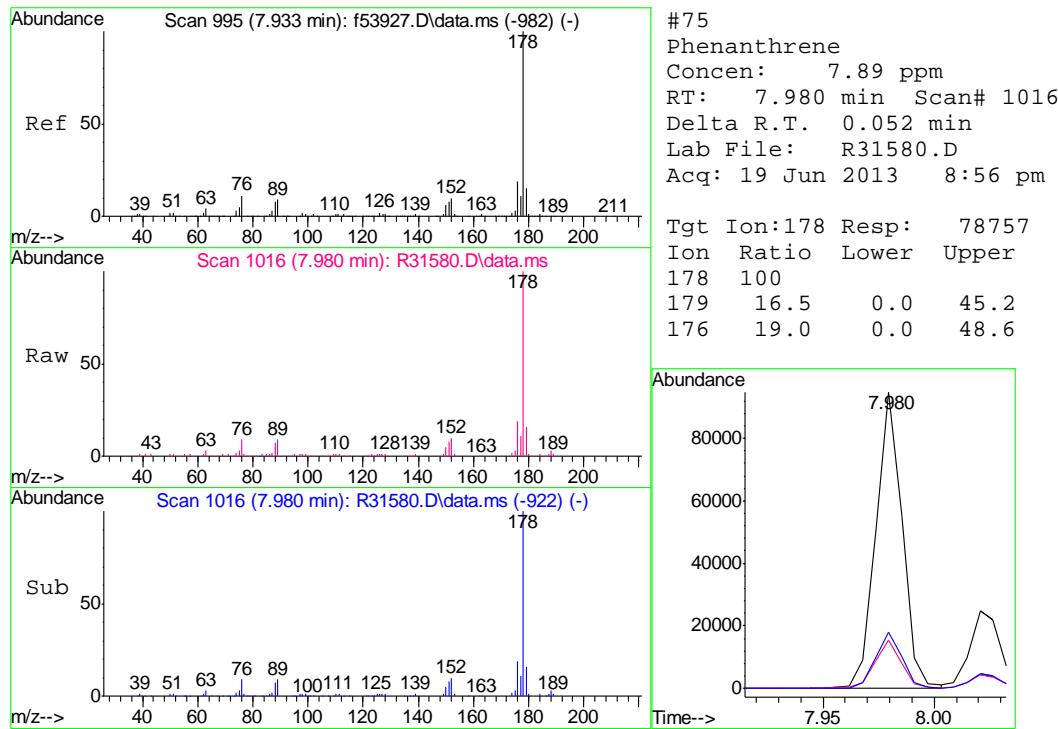
Quantitation Report (QT Reviewed)

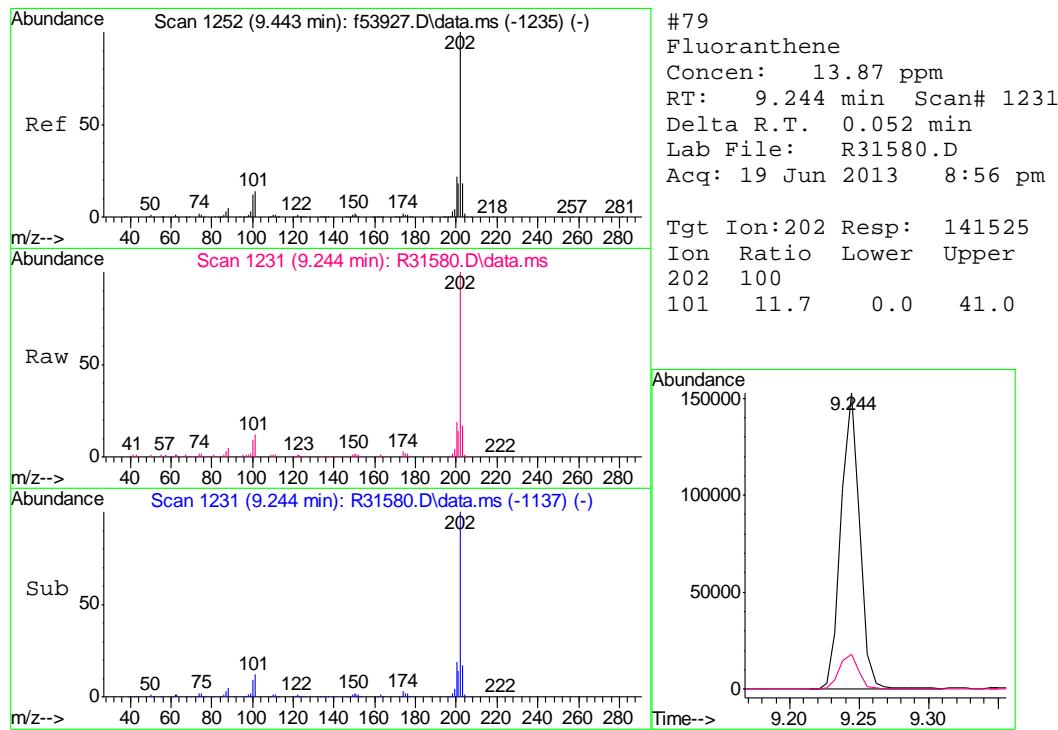
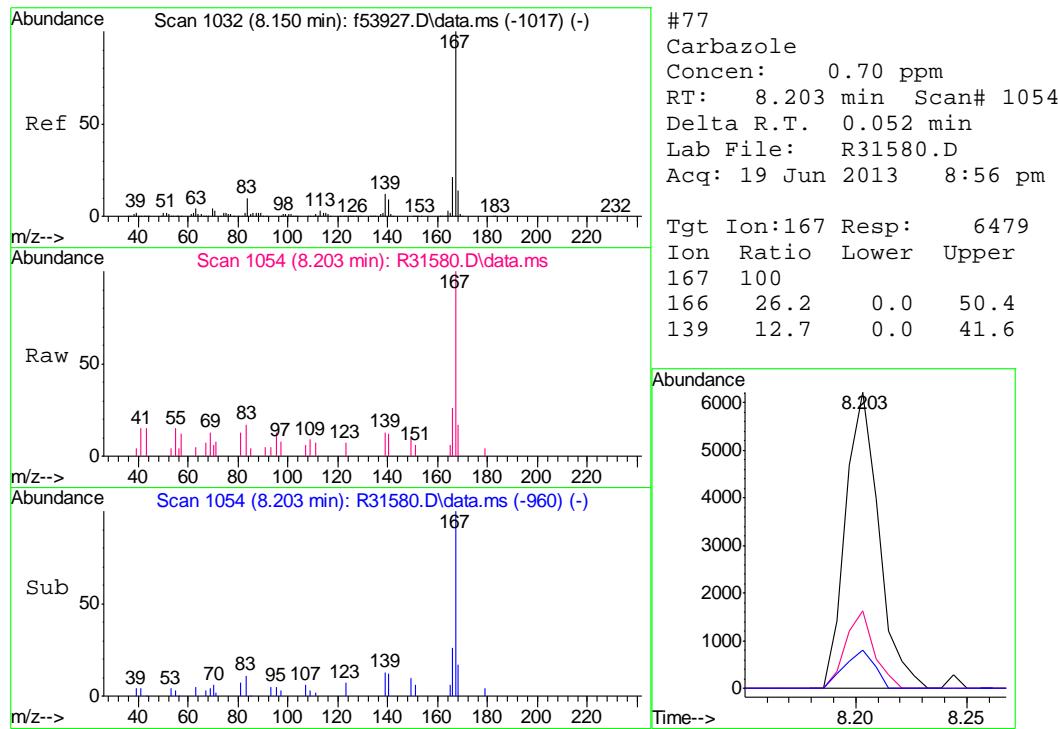
Data Path : C:\msdchem\1\data\R130619\
 Data File : R31580.D
 Acq On : 19 Jun 2013 8:56 pm
 Operator : kristinr
 Sample : jb39439-3
 Misc : op33636,msrl1149,20.08,,,1,1
 ALS Vial : 26 Sample Multiplier: 1

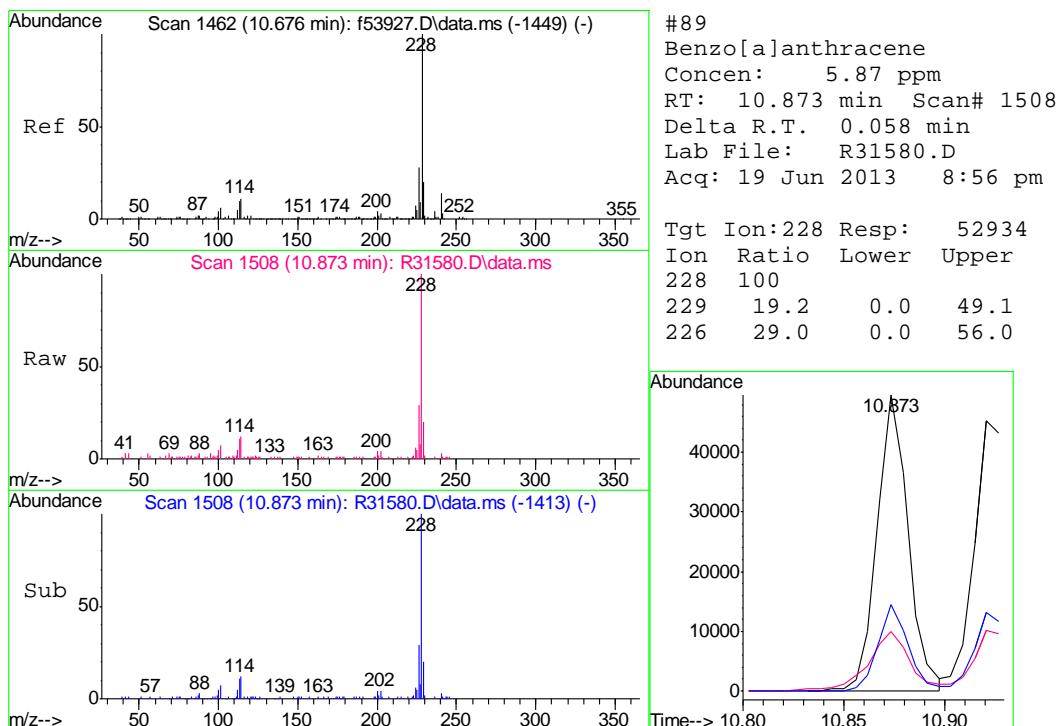
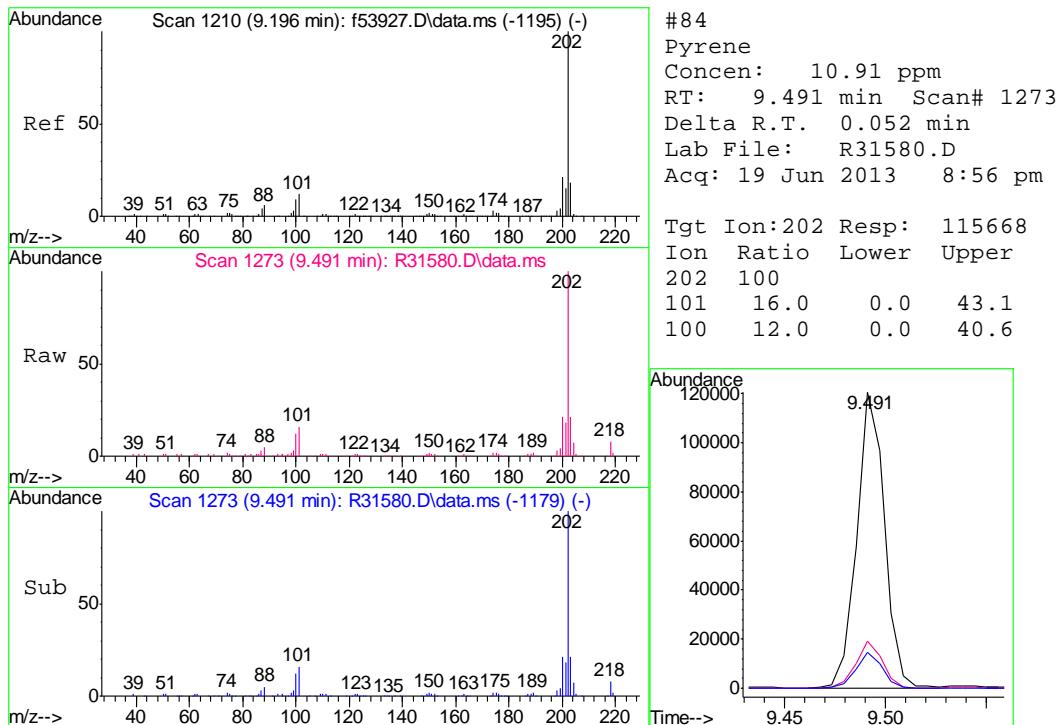
Quant Time: Jul 05 10:19:30 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration

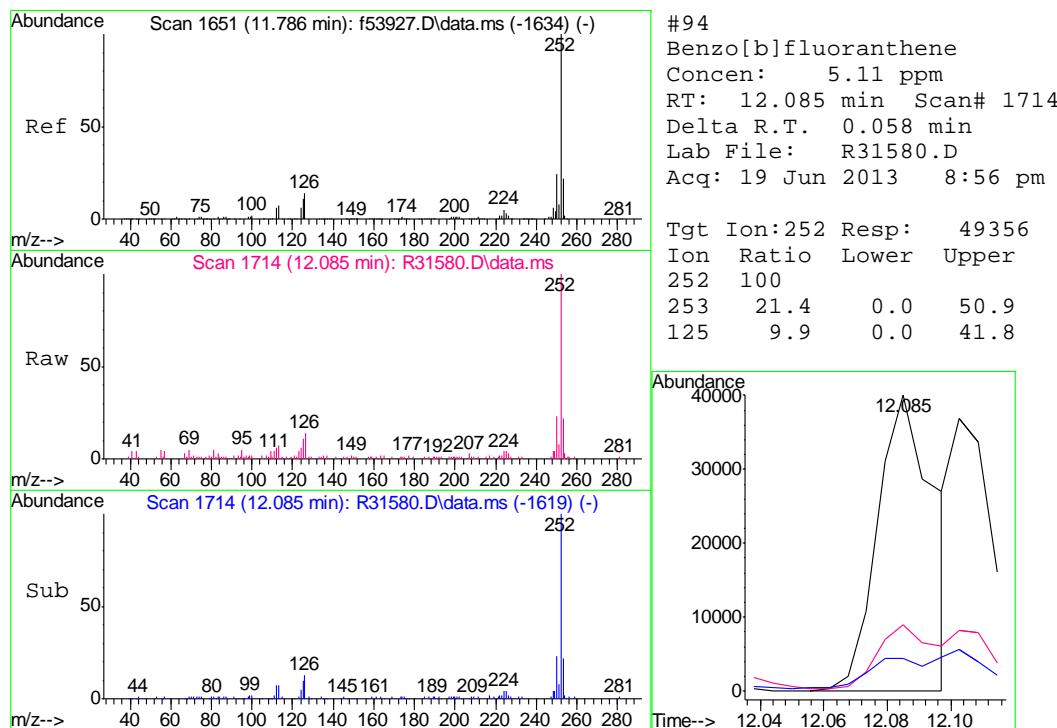
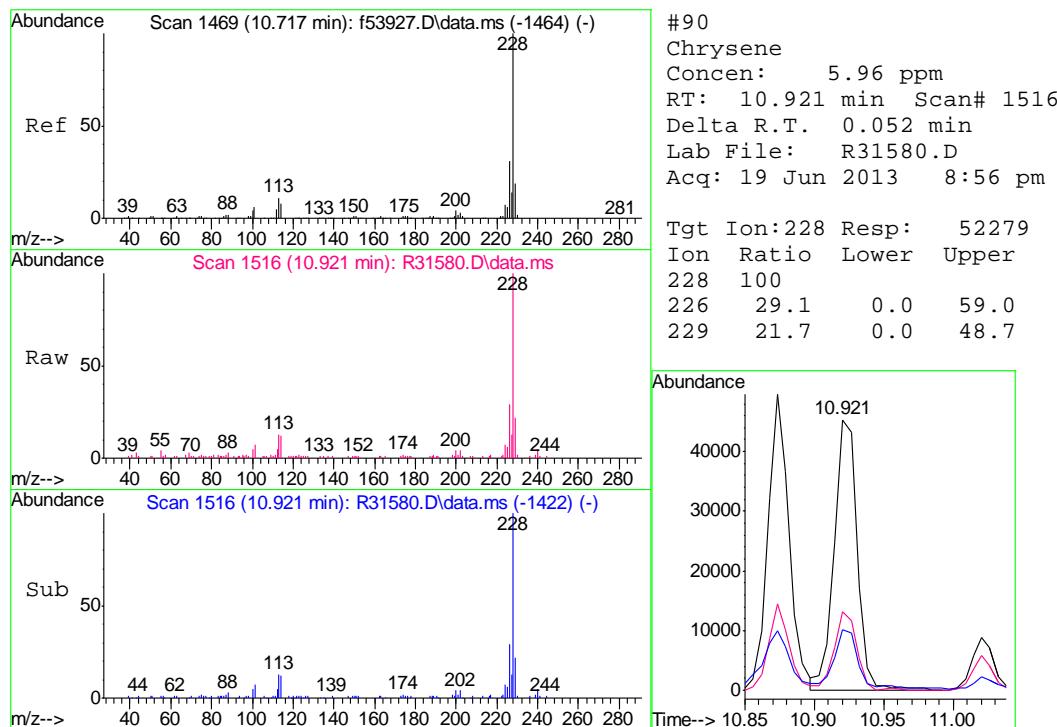


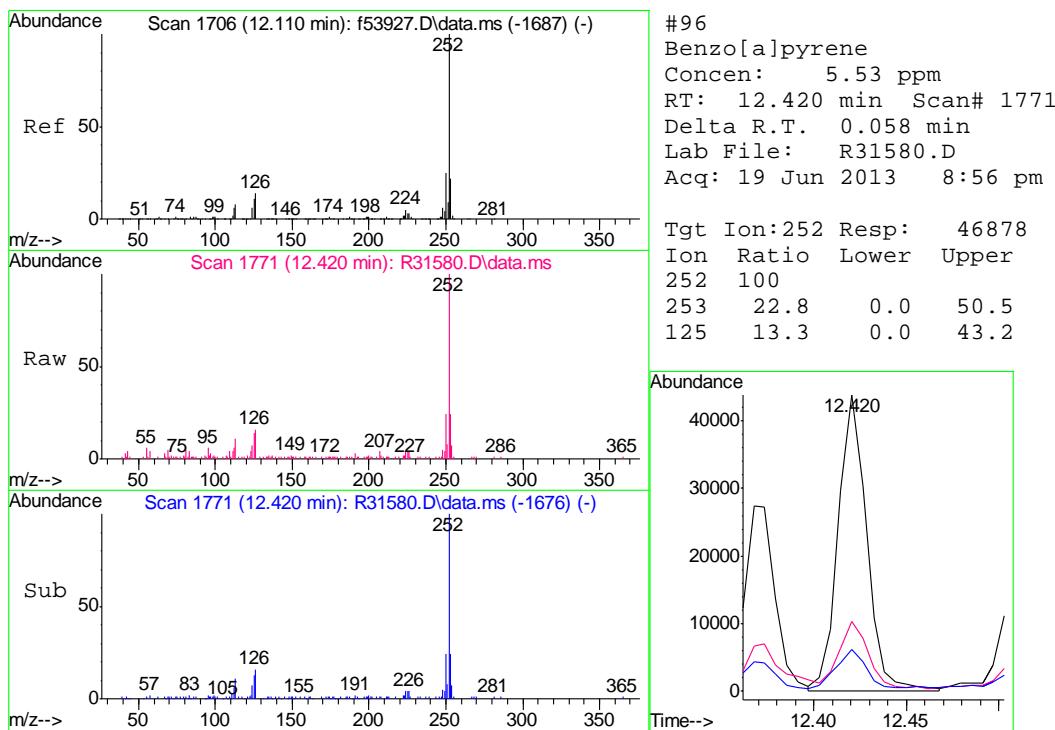
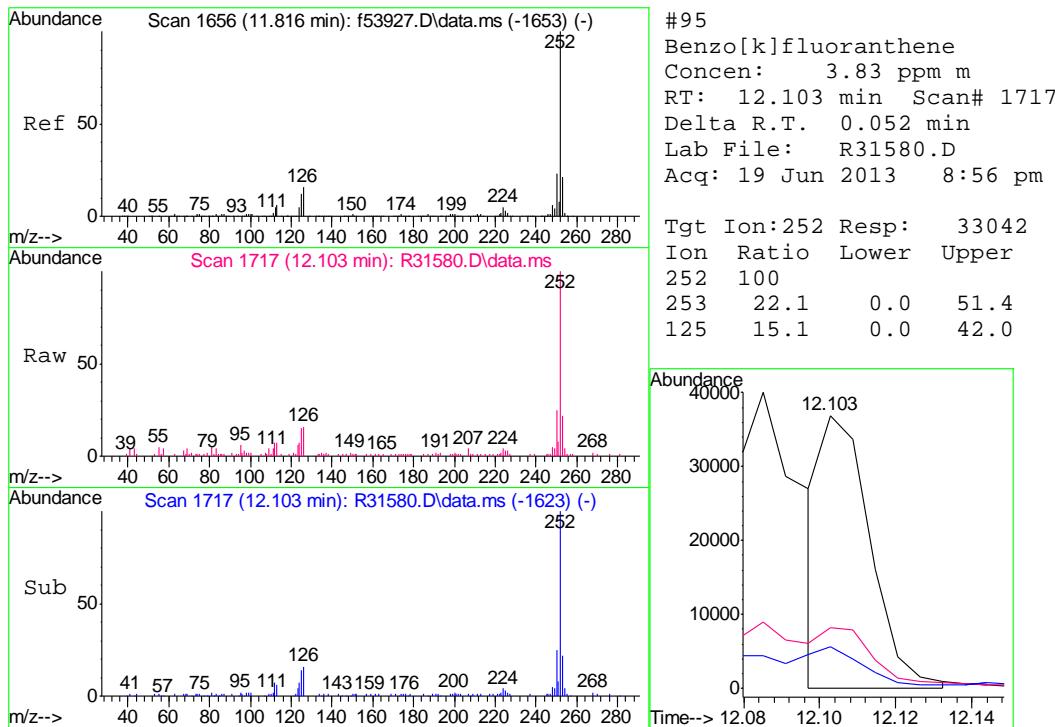


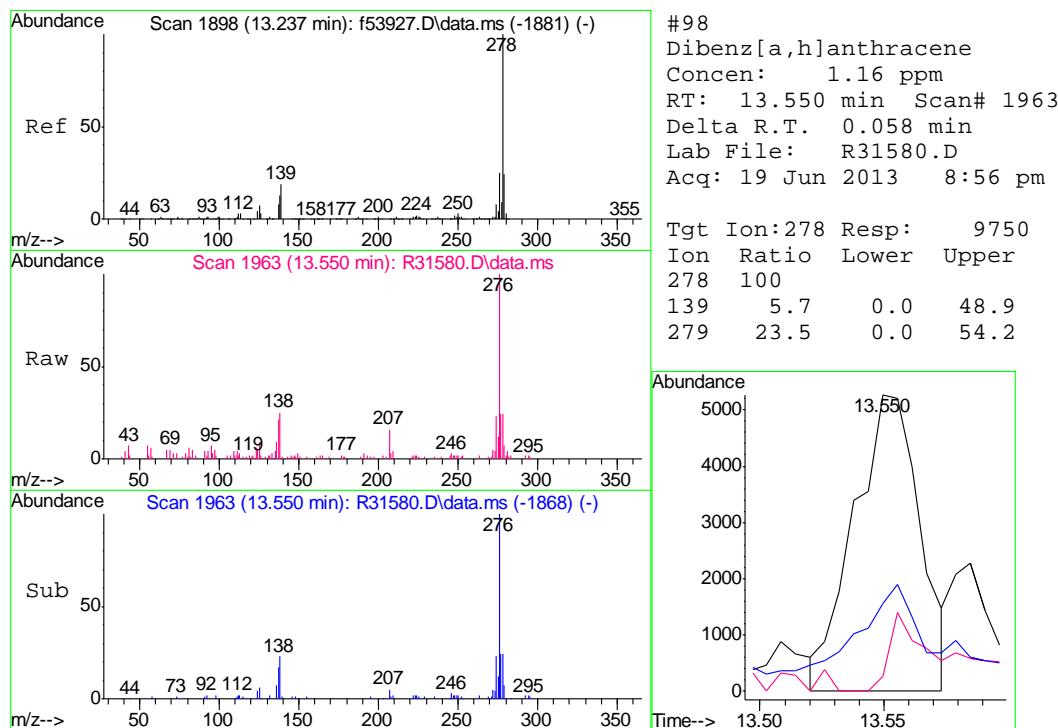
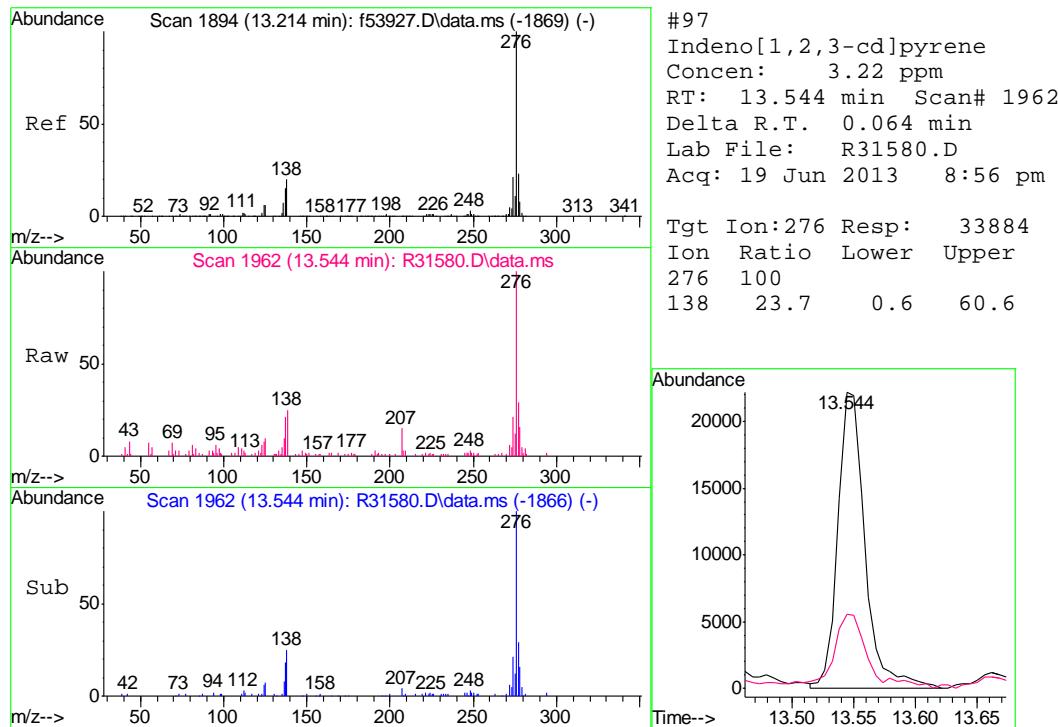


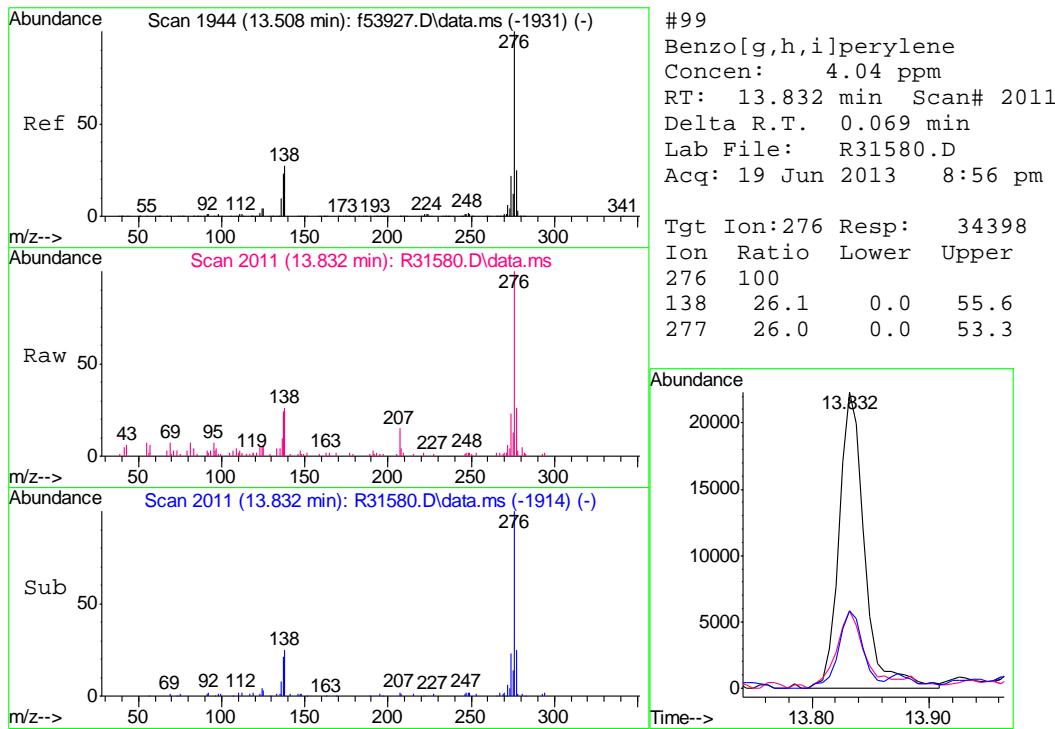












Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31581.D
 Acq On : 19 Jun 2013 9:19 pm
 Operator : kristinr
 Sample : JB39439-4
 Misc : op33636,msrl1149,20.11,,,1,1
 ALS Vial : 27 Sample Multiplier: 1

Quant Time: Jul 05 10:22:08 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.021	152	101189	40.00	ppm	0.05
21) 1,4-Dichlorobenzene-d4A	4.021	152	101155	40.00	PPM	0.05
23) Naphthalene-d8	5.074	136	381336	40.00	ppm	0.05
41) Naphthalene-d8a	5.074	136	381336	40.00	ppm	0.05
43) Acenaphthene-d10	6.591	164	200211	40.00	ppm	0.05
65) Acenaphthene-d10a	6.591	164	200211	40.00	ppm	0.05
67) Phenanthrene-d10	7.956	188	317355	40.00	ppm	0.05
80) Phenanthrene-d10a	7.956	188	317355	40.00	ppm	# 0.05
82) Chrysene-d12	10.897	240	308642	40.00	ppm	0.06
92) Perylene-d12	12.485	264	293708	40.00	ppm	0.06
100) Naphthalene-d8b	5.186	136	3631	40.00	ug/mL	0.18
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.092	112	104410	31.53	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery =	31.53%		
7) Phenol-d5	3.774	99	120751	28.37	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery =	28.37%#		
24) Nitrobenzene-d5	4.492	82	123843	32.61	ppm	0.05
Spiked Amount 50.000	Range 30 - 130		Recovery =	65.22%		
48) 2-Fluorobiphenyl	6.003	172	266669	37.84	ppm	0.05
Spiked Amount 50.000	Range 30 - 130		Recovery =	75.68%		
71) 2,4,6-Tribromophenol	7.315	330	35579	34.89	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery =	34.89%		
85) Terphenyl-d14	9.685	244	275904	39.69	ppm	0.06
Spiked Amount 50.000	Range 30 - 130		Recovery =	79.38%		
<hr/>						
Target Compounds						
9) 2-Chlorophenol	3.980	128	1514	0.41	ppm	# 36
33) Naphthalene	5.092	128	377919	36.88	ppm	96
34) 2,6-Dichlorophenol	5.109	162	15293	5.16	ppm	95
38) 2-Methylnaphthalene	5.680	142	538135	77.29	ppm	98
39) 1-Methylnaphthalene	5.774	142	309818	46.18	ppm	97
75) Phenanthrene	7.980	178	3063	0.33	ppm	94
<hr/>						

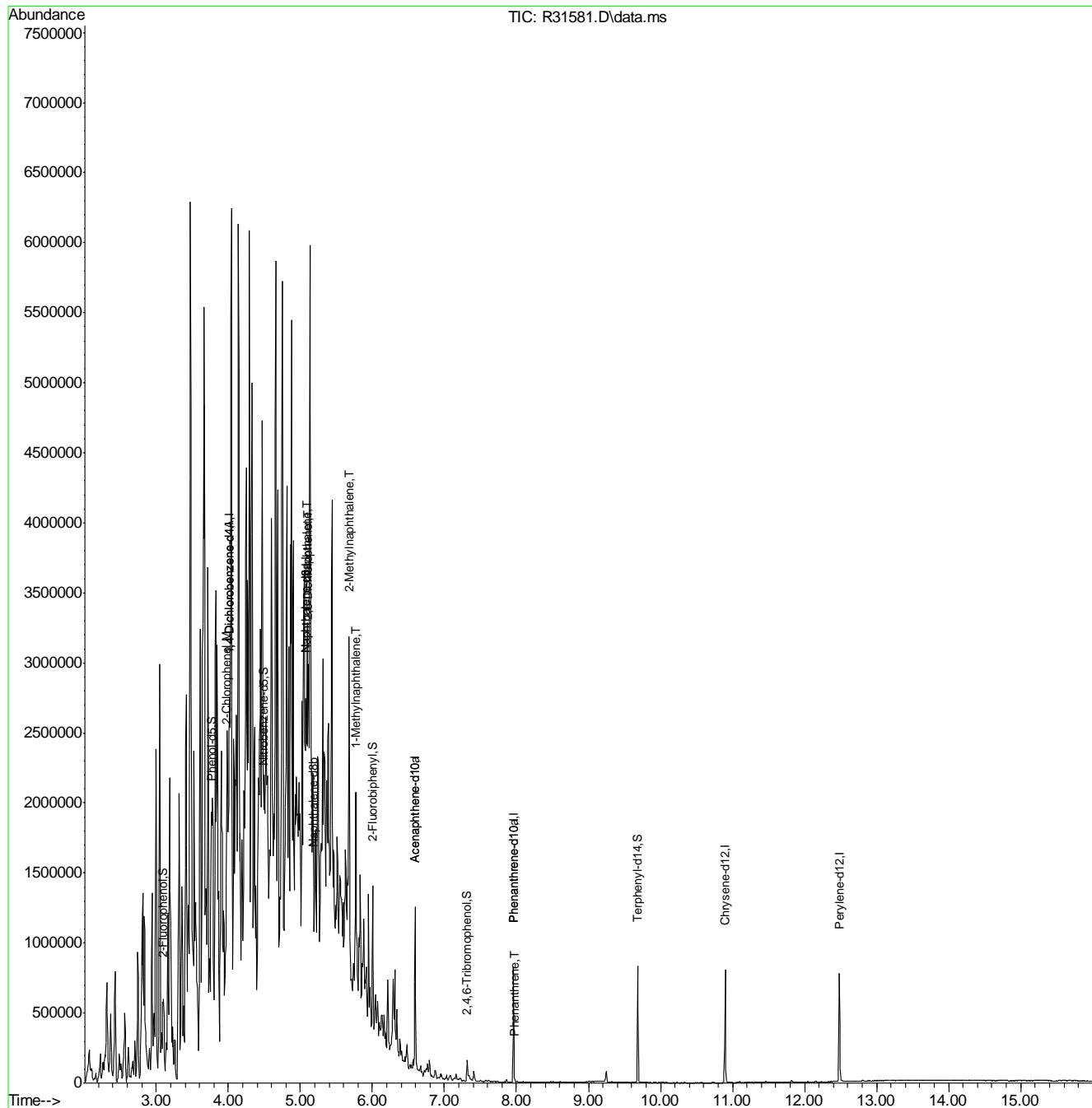
(#) = qualifier out of range (m) = manual integration (+) = signals summed

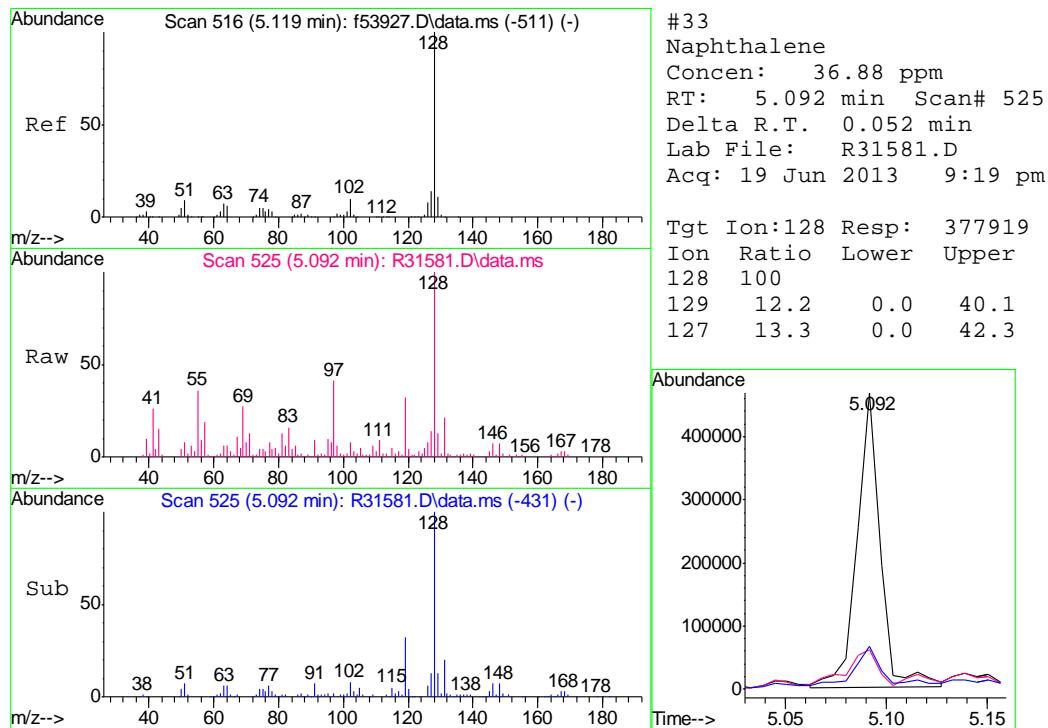
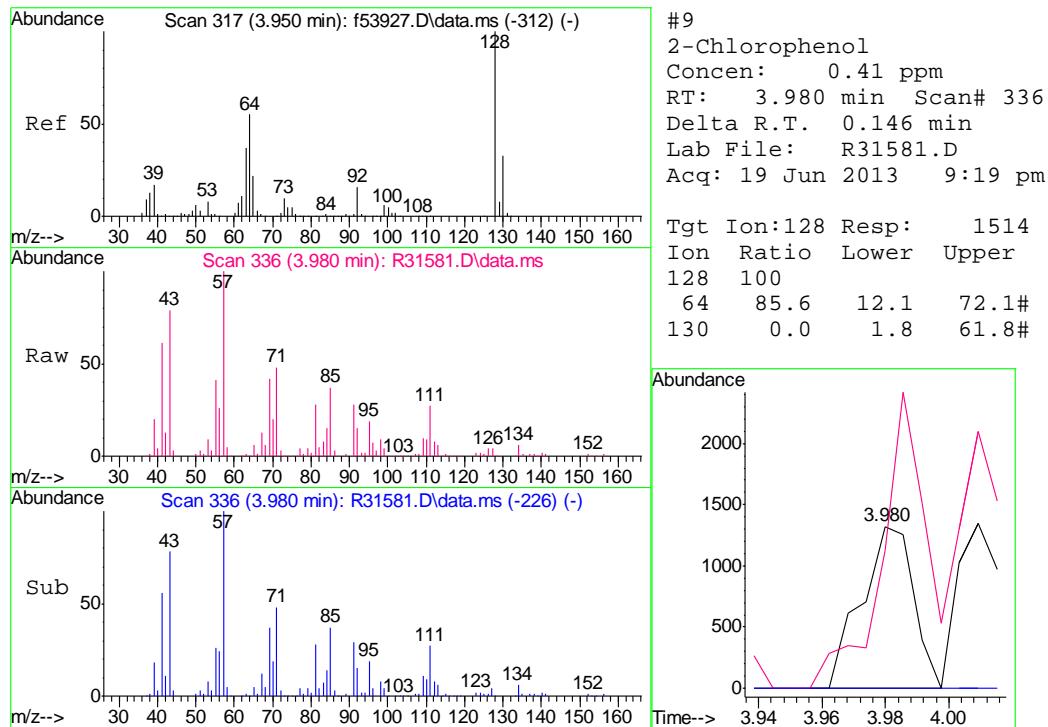
10.1.4
10

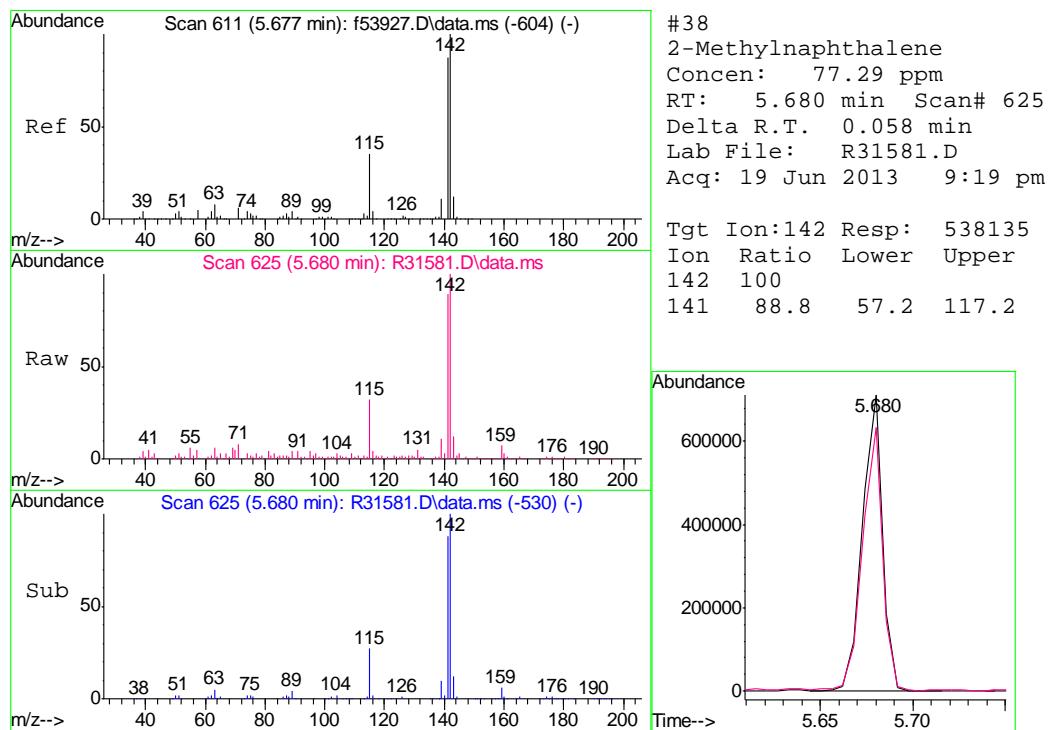
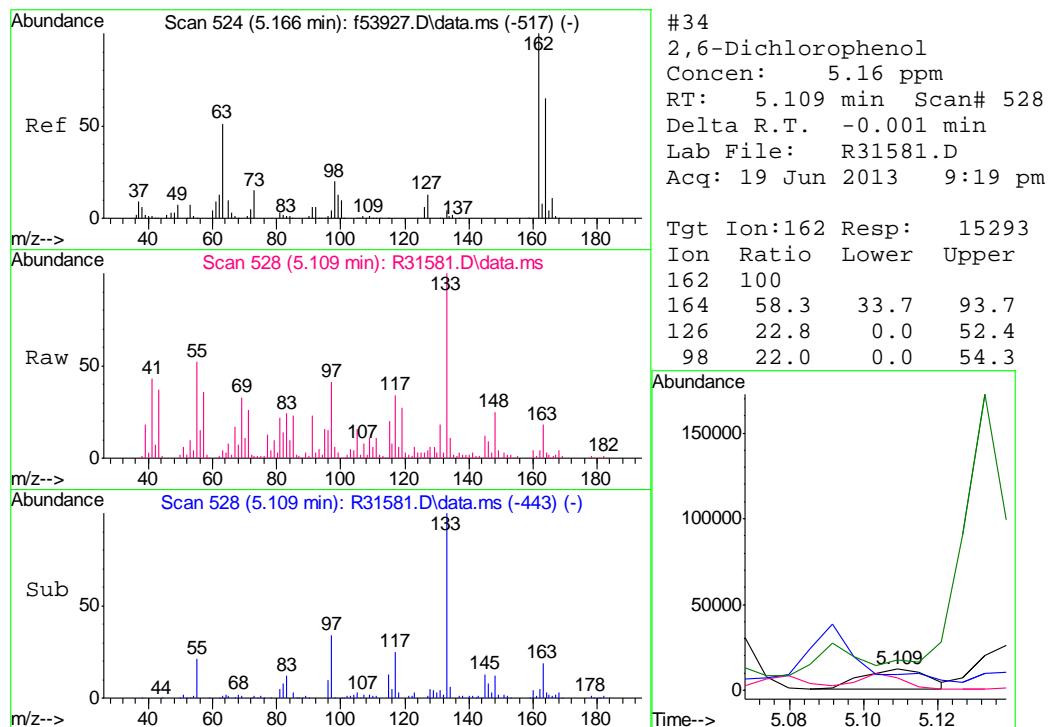
Quantitation Report (QT Reviewed)

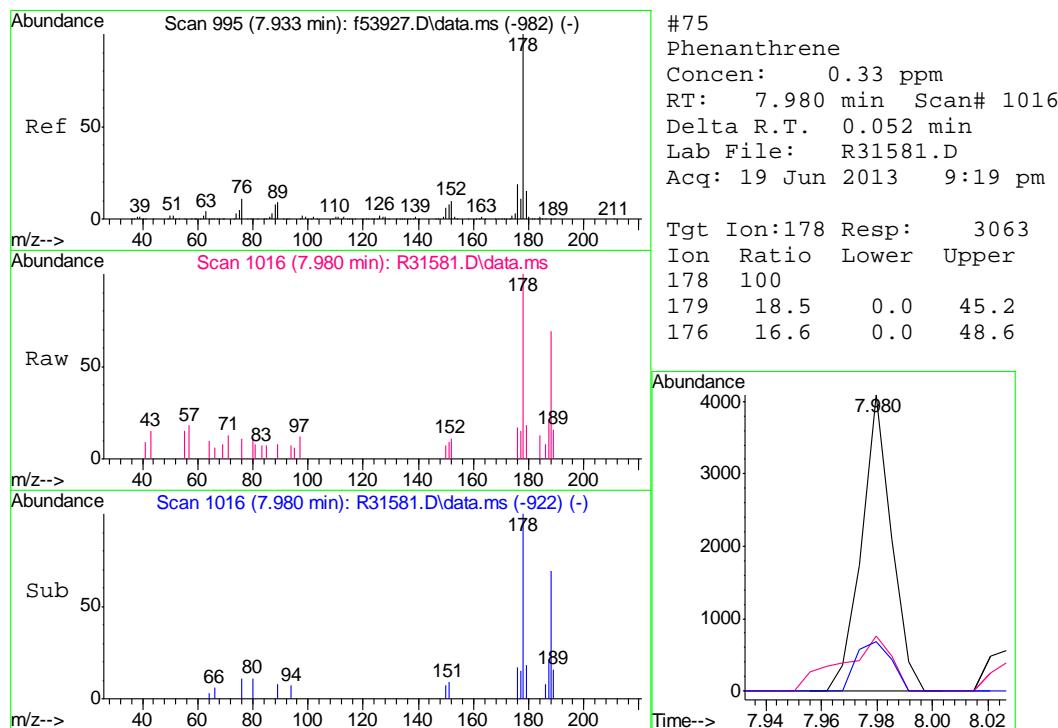
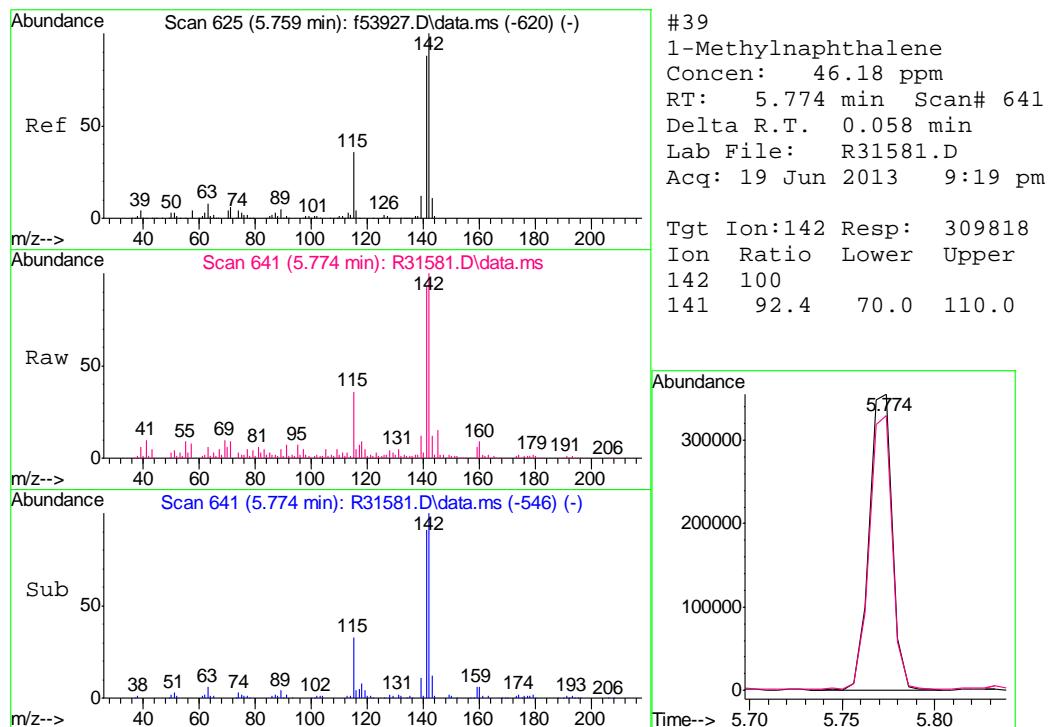
Data Path : C:\msdchem\1\data\R130619\
 Data File : R31581.D
 Acq On : 19 Jun 2013 9:19 pm
 Operator : kristinr
 Sample : JB39439-4
 Misc : op33636,msrl1149,20.11,,,1,1
 ALS Vial : 27 Sample Multiplier: 1

Quant Time: Jul 05 10:22:08 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration









Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31555.D
 Acq On : 19 Jun 2013 9:27 am
 Operator : kristinr
 Sample : op33636-mb
 Misc : op33636,msrl1148,20.08,,,1,1
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 03 17:42:13 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.015	152	77529	40.00	ppm	0.05
21) 1,4-Dichlorobenzene-d4A	4.015	152	77529	40.00	PPM	0.05
23) Naphthalene-d8	5.062	136	300243	40.00	ppm	0.04
41) Naphthalene-d8a	5.062	136	300243	40.00	ppm	0.04
43) Acenaphthene-d10	6.586	164	175920	40.00	ppm	0.04
65) Acenaphthene-d10a	6.586	164	175920	40.00	ppm	0.04
67) Phenanthrene-d10	7.956	188	308147	40.00	ppm	0.05
80) Phenanthrene-d10a	7.956	188	308147	40.00	ppm	0.05
82) Chrysene-d12	10.897	240	334887	40.00	ppm	0.06
92) Perylene-d12	12.479	264	319443	40.00	ppm	0.06
100) Naphthalene-d8b	5.062	136	300243	40.00	ug/mL	# 0.06
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.092	112	76320	30.08	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery = 30.08%			
7) Phenol-d5	3.768	99	95721	29.35	ppm	0.04
Spiked Amount 100.000	Range 30 - 130		Recovery = 29.35%#			
24) Nitrobenzene-d5	4.486	82	79947	26.74	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery = 53.48%			
48) 2-Fluorobiphenyl	5.997	172	198210	32.01	ppm	0.04
Spiked Amount 50.000	Range 30 - 130		Recovery = 64.02%			
71) 2,4,6-Tribromophenol	7.309	330	32703	33.03	ppm	0.05
Spiked Amount 100.000	Range 30 - 130		Recovery = 33.03%			
85) Terphenyl-d14	9.685	244	283150	37.54	ppm	0.06
Spiked Amount 50.000	Range 30 - 130		Recovery = 75.08%			
<hr/>						
Target Compounds				Qvalue		
<hr/>						

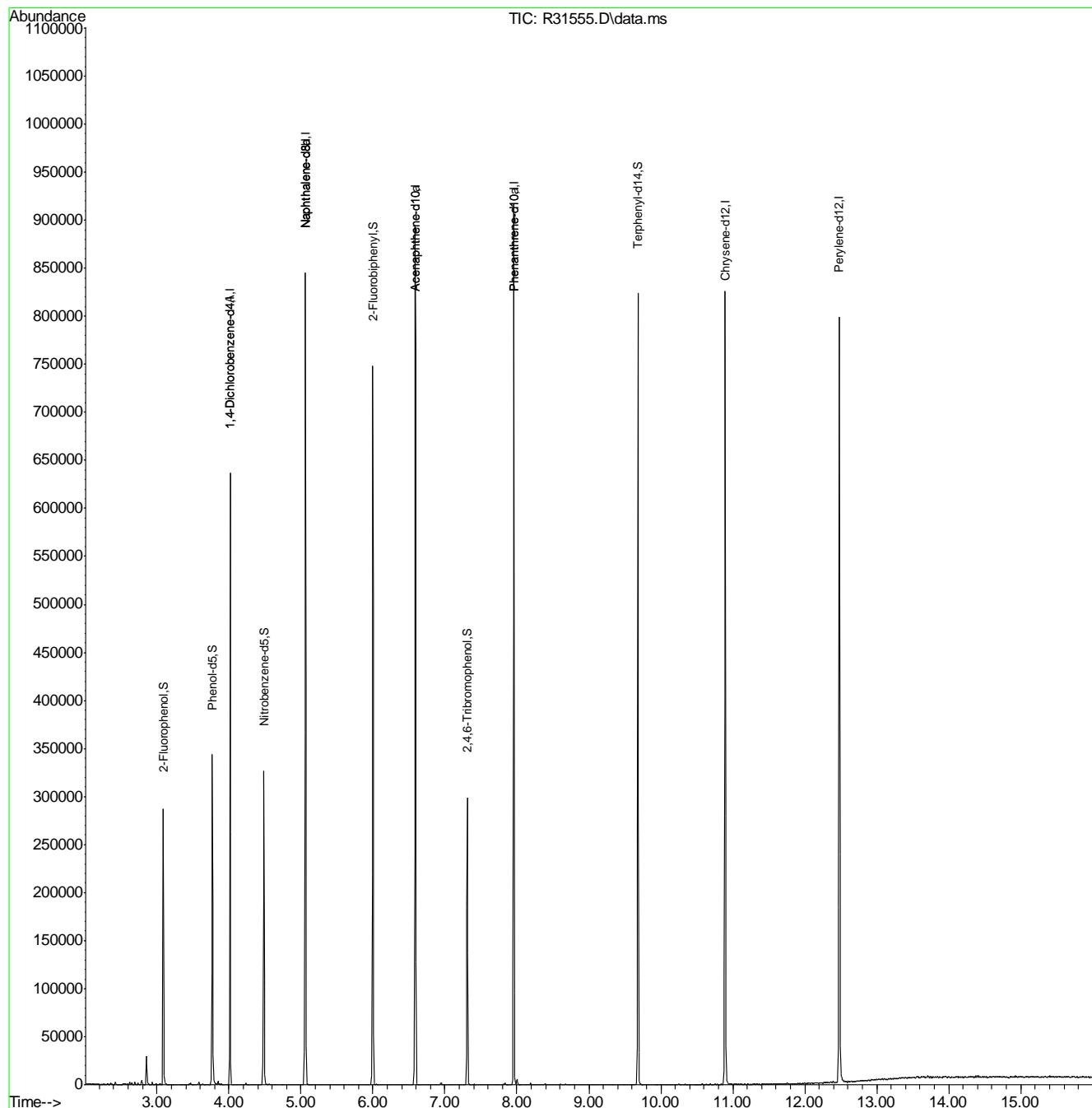
(#) = qualifier out of range (m) = manual integration (+) = signals summed

10.2.1
10

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\R130619\
 Data File : R31555.D
 Acq On : 19 Jun 2013 9:27 am
 Operator : kristinr
 Sample : op33636-mb
 Misc : op33636,msr1148,20.08,,,1,1
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 03 17:42:13 2013
 Quant Method : W:\1\methods\R130530_8270+.m
 Quant Title : SW-864 Method 8270
 QLast Update : Tue Jun 25 14:19:44 2013
 Response via : Initial Calibration





GC Volatiles

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33671-MB	BB48728.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907

The QC reported here applies to the following samples:

Method: SW846 8011

JB39439-1, JB39439-2, JB39439-3, JB39439-4

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	2.5	0.95	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	104%
460-00-4	Bromofluorobenzene (S)	159%

Blank Spike Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33671-BS	BB48729.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907

The QC reported here applies to the following samples:

Method: SW846 8011

JB39439-1, JB39439-2, JB39439-3, JB39439-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
106-93-4	1,2-Dibromoethane	3.30	4.0	121	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	124%	61-167%
460-00-4	Bromofluorobenzene (S)	148%	61-167%

11.2.1
11

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33671-MS	BB48730.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907
OP33671-MSD	BB48731.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907
JB39439-1	BB48732.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907

The QC reported here applies to the following samples:

Method: SW846 8011

JB39439-1, JB39439-2, JB39439-3, JB39439-4

CAS No.	Compound	JB39439-1		Spike	MS	MS	MSD	MSD	Limits	
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	%	RPD	Rec/RPD
106-93-4	1,2-Dibromoethane	ND		3.66	5.0	137	4.6	125	8	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	JB39439-1	Limits
460-00-4	Bromofluorobenzene (S)	146%	219% * a	99%	61-167%
460-00-4	Bromofluorobenzene (S)	172% * a	166%	140%	61-167%

(a) Outside control limits due to possible matrix interference.

11.3.1
11

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8011

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
JB39439-1	BB48732.D	99.0	140.0
JB39439-2	BB48733.D	116.0	164.0
JB39439-3	BB48734.D	107.0	176.0* ^c
JB39439-4	BB48735.D	197.0* ^c	156.0
OP33671-BS	BB48729.D	124.0	148.0
OP33671-MB	BB48728.D	104.0	159.0
OP33671-MS	BB48730.D	146.0	172.0* ^c
OP33671-MSD	BB48731.D	219.0* ^c	166.0

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1
- (c) Outside control limits due to possible matrix interference.

11.4.1
11

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	GBB2907-ICC2907	Injection Date:	06/19/13
Lab File ID:	BB48722.D	Injection Time:	11:44
Instrument ID:	GCBB	Method:	SW846 8011

S1 ^a
RT S1 ^b
RT

Check Std	4.98	4.71
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP33671-MB	BB48728.D	06/19/13	14:32	4.96	4.72
OP33671-BS	BB48729.D	06/19/13	14:59	4.96	4.71
OP33671-MS	BB48730.D	06/19/13	15:28	4.96	4.72
OP33671-MSD	BB48731.D	06/19/13	15:56	4.97	4.72
JB39439-1	BB48732.D	06/19/13	16:24	4.96	4.72
JB39439-2	BB48733.D	06/19/13	16:51	4.96	4.72
JB39439-3	BB48734.D	06/19/13	17:18	4.96	4.72
JB39439-4	BB48735.D	06/19/13	17:47	4.93	4.71
ZZZZZZ	BB48736.D	06/19/13	18:15	4.94	4.71
ZZZZZZ	BB48737.D	06/19/13	18:42	4.93	4.71

Surrogate Compounds

S1 = Bromofluorobenzene (S)

(a) Retention time from GC signal #2

(b) Retention time from GC signal #1

11.5.1
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Initial Calibration Summary

Page 1 of 1

Job Number: JB39439

Sample: GBB2907-ICC2907

Account: ALNJ Accutest New Jersey

Lab FileID: BB48722.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report GCBB

Method : C:\msdchem\1\METHODS\ES130619.M (ChemStation Integrator)

Title : v8011edb soil

Last Update : Wed Jun 19 14:10:04 2013

Response via : Initial Calibration

Calibration Files

1	=bb48721.d	2	=bb48722.d	3	=bb48723.d	4	=bb48724.d
5	=bb48725.d	6	=bb48726.d				

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	1,2-Dibromoethane	2.787	2.975	3.022	2.874	2.882	2.963	2.917 E5	2.93
2)	s 4-Bromofluorobenzen	1.442	1.430	1.406	1.431	1.446	1.393	1.425 E4	1.46
3)	1,2-Dibromo-3-chlor	6.439	6.727	6.852	6.599	6.846	6.513	6.662 E5	2.60

Signal #2

1)	1,2-Dibromoethane	3.694	3.982	4.120	3.936	3.944	3.959	3.939 E5	3.49
2)	s 4-Bromofluorobenzen	1.331	1.302	1.316	1.300	1.326	1.266	1.307 E4	1.80
3)	1,2-Dibromo-3-chlor	7.079	7.154	7.382	6.988	7.240	6.991	7.139 E5	2.15

(#) = Out of Range

ES130619.M

Thu Jun 20 08:22:46 2013

11.6.1

11

Initial Calibration Verification

Page 1 of 1

Job Number: JB39439

Sample: GBB2907-ICV2907

Account: ALNJ Accutest New Jersey

Lab FileID: BB48727.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\Bb...19\bb48727.d\ECD1A.CH Vial: 82
Signal #2 : C:\msdchem\1\DATA\Bb130619\bb48727.d\ECD2B.CH
Acq On : 19-Jun-13, 14:04:25 Operator: andrip
Sample : icv2907-20, std-7 Inst : GCBB
Misc : op33671, gbb2907, 30,,,50,,s Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\ES130619.M (ChemStation Integrator)
Title : v8011edb soil
Last Update : Wed Jun 19 14:10:04 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 115%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT	Window
1 1,2-Dibromoethane	291.715	316.033 E3	-8.3	106	0.00	3.68-	3.74
2 s 4-Bromofluorobenzene	14.248	15.117 E3	-6.1	106	0.00	4.69-	4.75
3 1,2-Dibromo-3-chloropr	666.243	695.478 E3	-4.4	103	0.00	6.35-	6.41

***** Signal #2 *****

1 1,2-Dibromoethane	393.905	426.505 E3	-8.3	107	0.00	3.76-	3.82
2 s 4-Bromofluorobenzene	13.069	14.306 E3	-9.5	110	-0.03	4.91-	4.97
3 1,2-Dibromo-3-chloropr	713.912	749.060 E3	-4.9	105	0.00	6.31-	6.37

(#) = Out of Range SPCC's out = 0 CCC's out = 0
bb48722.d ES130619.M Thu Jun 20 08:22:41 2013

11.6.2

11

Continuing Calibration Summary

Page 1 of 1

Job Number: JB39439

Sample: GBB2907-CC2907

Account: ALNJ Accutest New Jersey

Lab FileID: BB48738.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\Bb...19\bb48738.d\ECD1A.CH Vial: 77
Signal #2 : C:\msdchem\1\DATA\Bb130619\bb48738.d\ECD2B.CH
Acq On : 19-Jun-13, 19:10:29 Operator: andrip
Sample : cc2907-20, std-2 Inst : GCBB
Misc : op33671, gbb2907, 30,,,50,,s Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\ES130619.M (ChemStation Integrator)
Title : v8011edb soil
Last Update : Wed Jun 19 14:10:04 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 115%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT	Window
1	1,2-Dibromoethane	291.715	307.797	E3	-5.5	103	0.00	3.68- 3.74
2 s	4-Bromofluorobenzene	14.248	16.237	E3	-14.0	114	0.00	4.68- 4.74
3	1,2-Dibromo-3-chloropr	666.243	697.809	E3	-4.7	104	0.00	6.35- 6.41

***** Signal #2 *****

1	1,2-Dibromoethane	393.905	394.602	E3	-0.2	99	-0.01	3.75- 3.81
2 s	4-Bromofluorobenzene	13.069	13.718	E3	-5.0	105	-0.05	4.90- 4.96
3	1,2-Dibromo-3-chloropr	713.912	735.368	E3	-3.0	103	0.00	6.30- 6.36

(#) = Out of Range SPCC's out = 0 CCC's out = 0
bb48722.d ES130619.M Thu Jun 20 08:32:40 2013

11.6.3
11



GC Volatiles

Raw Data

(Accutest Labs of New England, Inc.)

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Andri Piluri
 06/20/13 08:28

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48732.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 16:24:15
 Operator : andrip
 Sample : jb39439-1,op33671
 Misc : op33671,gbb2907,30.69,,,50,,s
 ALS Vial : 5 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:26:53 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
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System Monitoring Compounds

2) s 4-Bromofl...	4.716	4.958f	997668	647211	70.021m	49.521m#
Spiked Amount	50.000	Range	60 - 140	Recovery	= 140.04%#	99.04%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

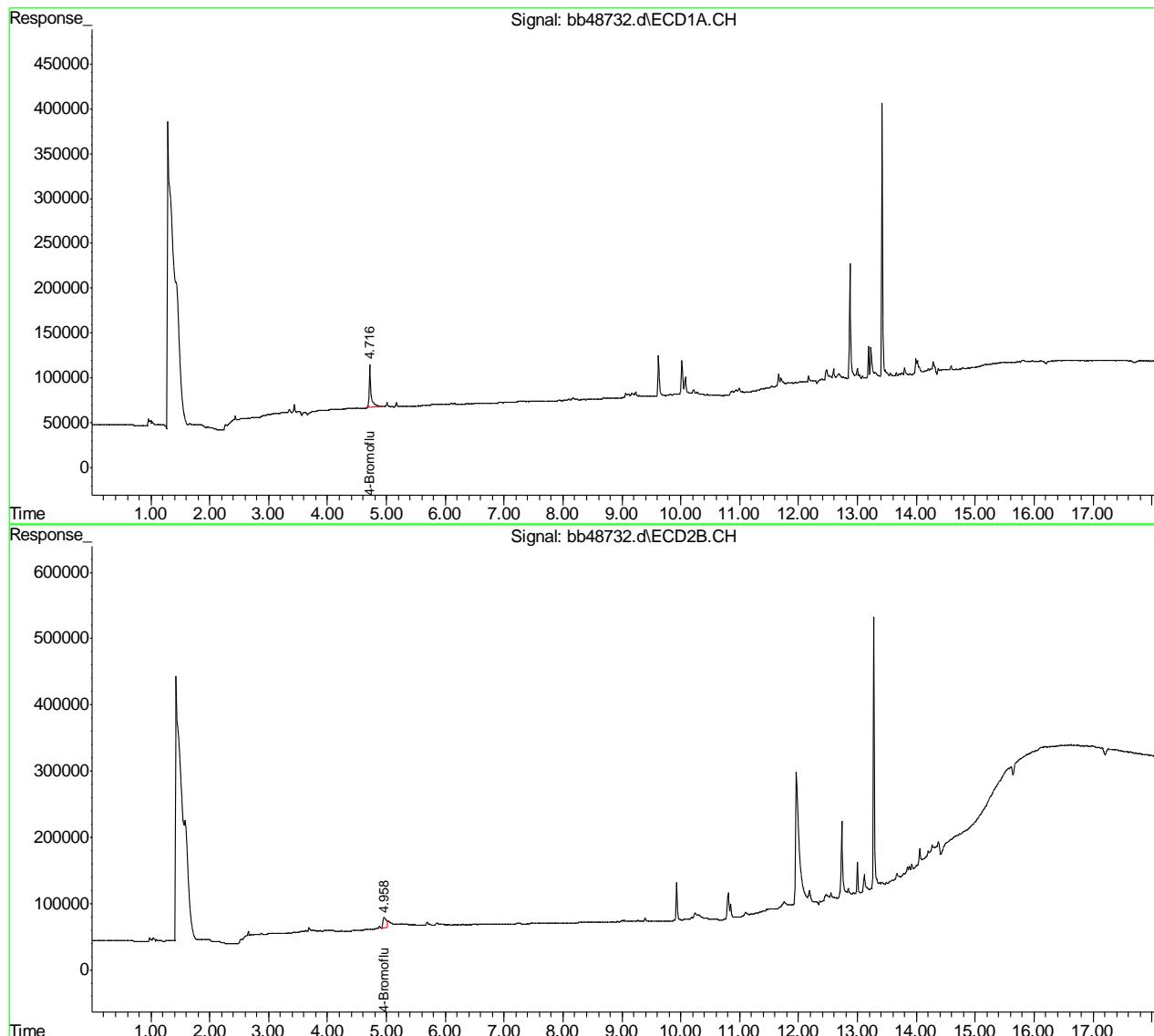
 12.1.1
 12

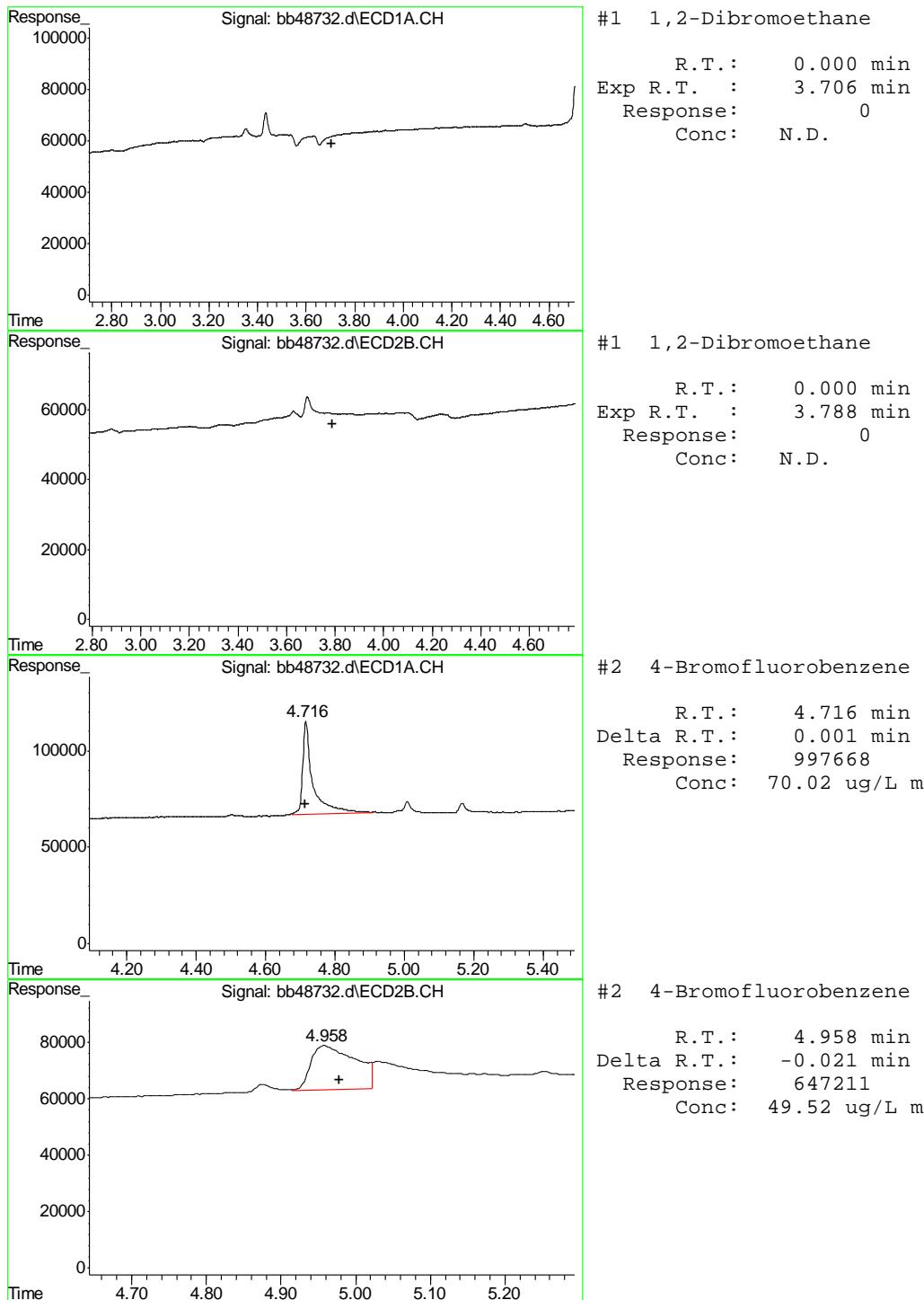
Quantitation Report (QT Reviewed)

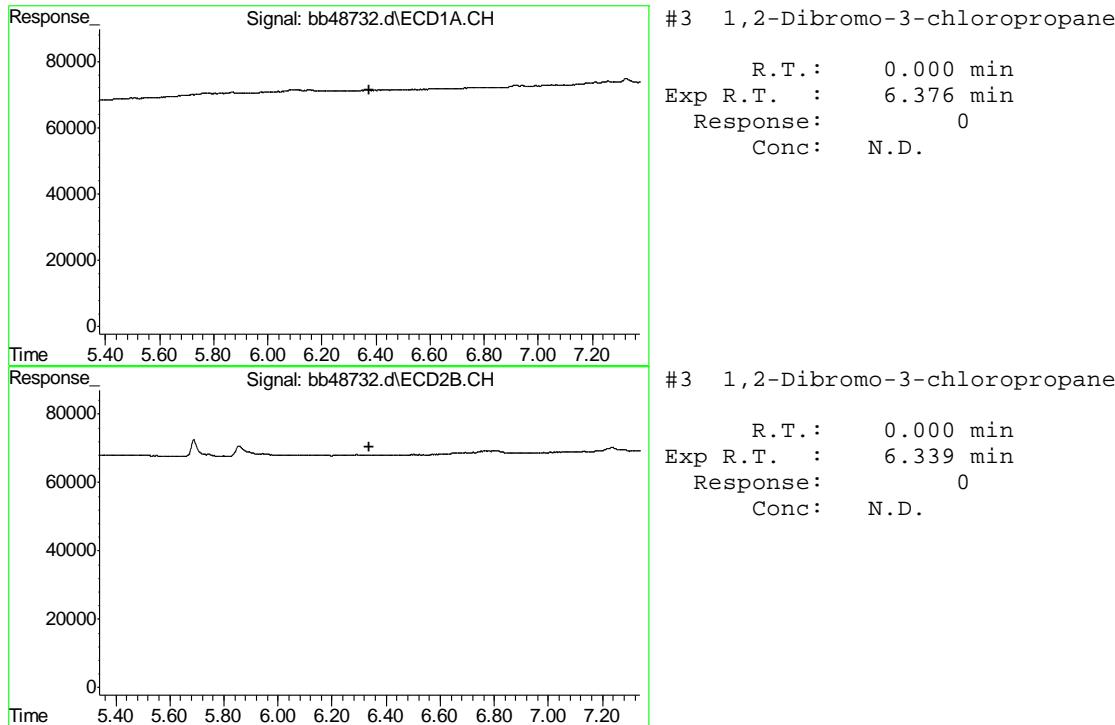
Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48732.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 16:24:15
 Operator : andrip
 Sample : jb39439-1,op33671
 Misc : op33671,gbb2907,30.69,,,50,,,s
 ALS Vial : 5 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:26:53 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







12.1.1

12

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Andri Piluri
 06/20/13 08:28

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48733.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 16:51:41
 Operator : andrip
 Sample : jb39439-2,op33671
 Misc : op33671,gbb2907,30.30,,,50,,s
 ALS Vial : 6 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:27:10 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	4.716	4.959f	1165660	757787	81.812m	57.982m#
Spiked Amount	50.000	Range	60 - 140	Recovery	=	163.62%# 115.96%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

12.1.2

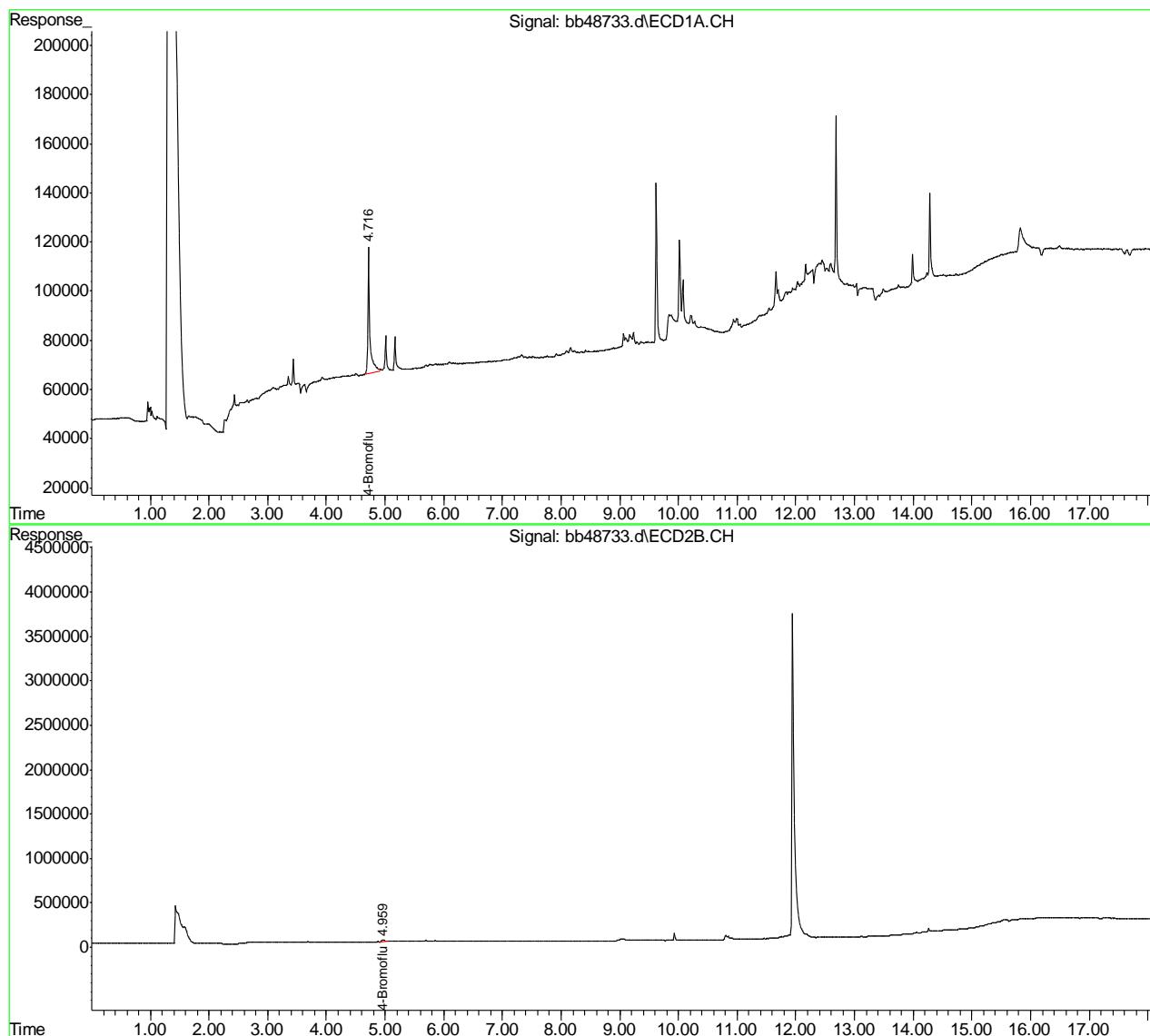
12

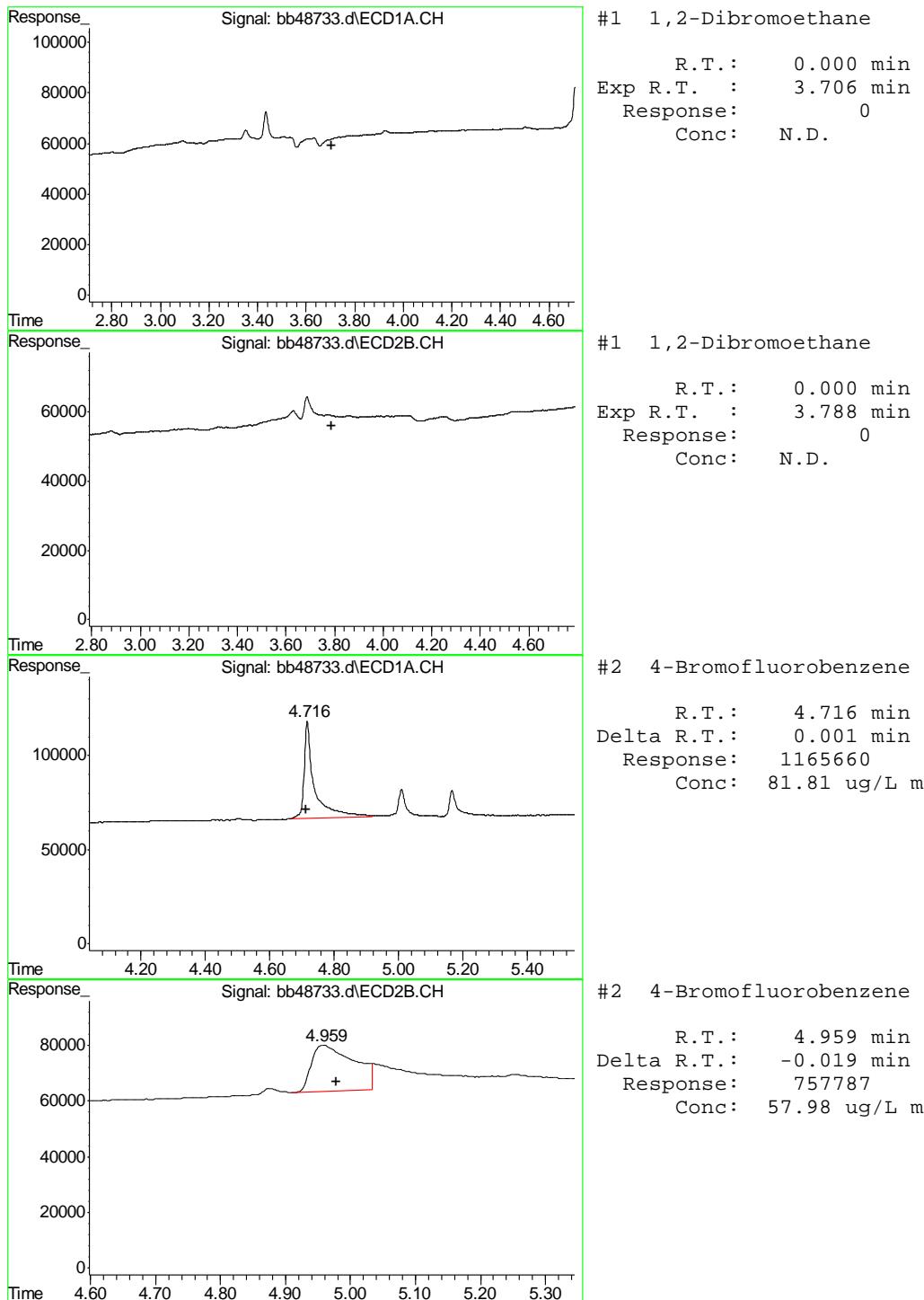
Quantitation Report (QT Reviewed)

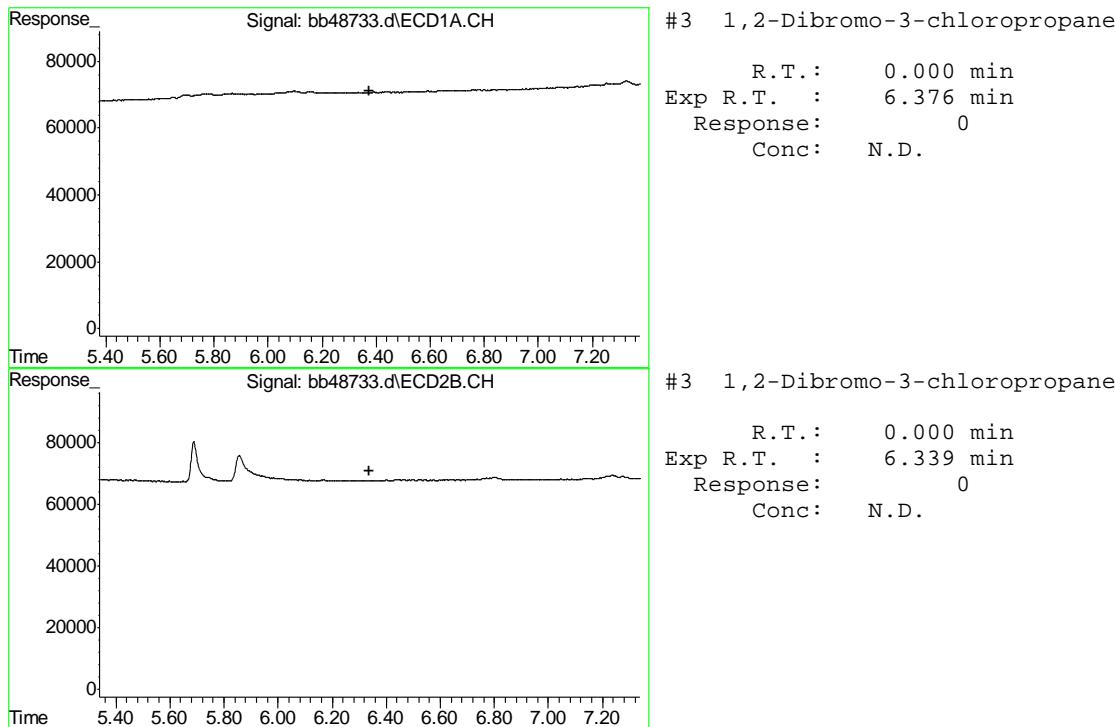
Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48733.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 16:51:41
 Operator : andrip
 Sample : jb39439-2,op33671
 Misc : op33671,gbb2907,30.30,,,50,,,s
 ALS Vial : 6 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:27:10 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







12.1.2

12

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Andri Piluri
 06/20/13 08:28

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48734.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 17:18:59
 Operator : andrip
 Sample : jb39439-3,op33671
 Misc : op33671,gbb2907,30.99,,,50,,s
 ALS Vial : 7 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:27:25 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	4.716	4.956f	1256307	702018	88.174m	53.715m#
Spiked Amount	50.000	Range	60 - 140	Recovery	= 176.35%#	107.43%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

12.1.3

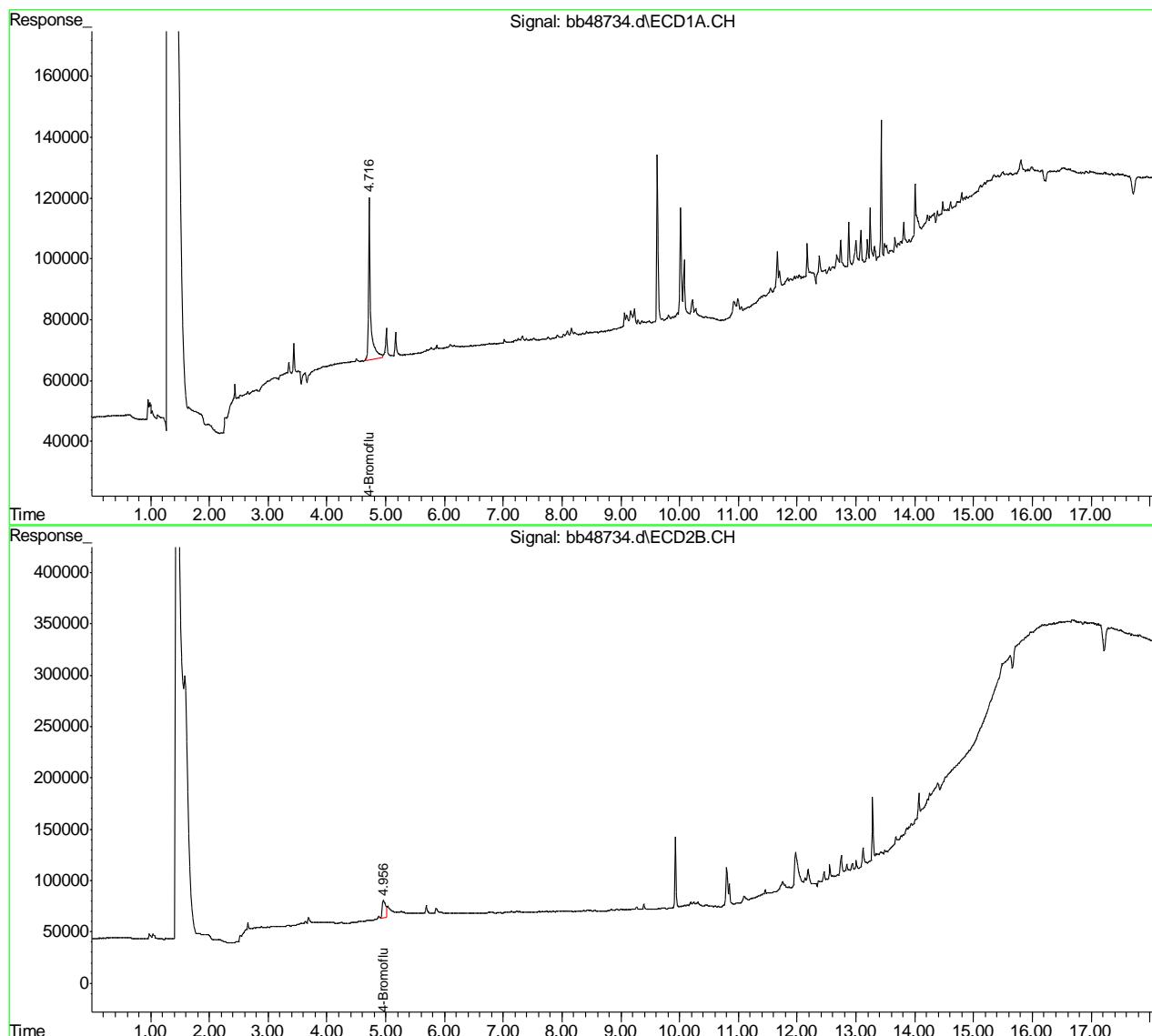
12

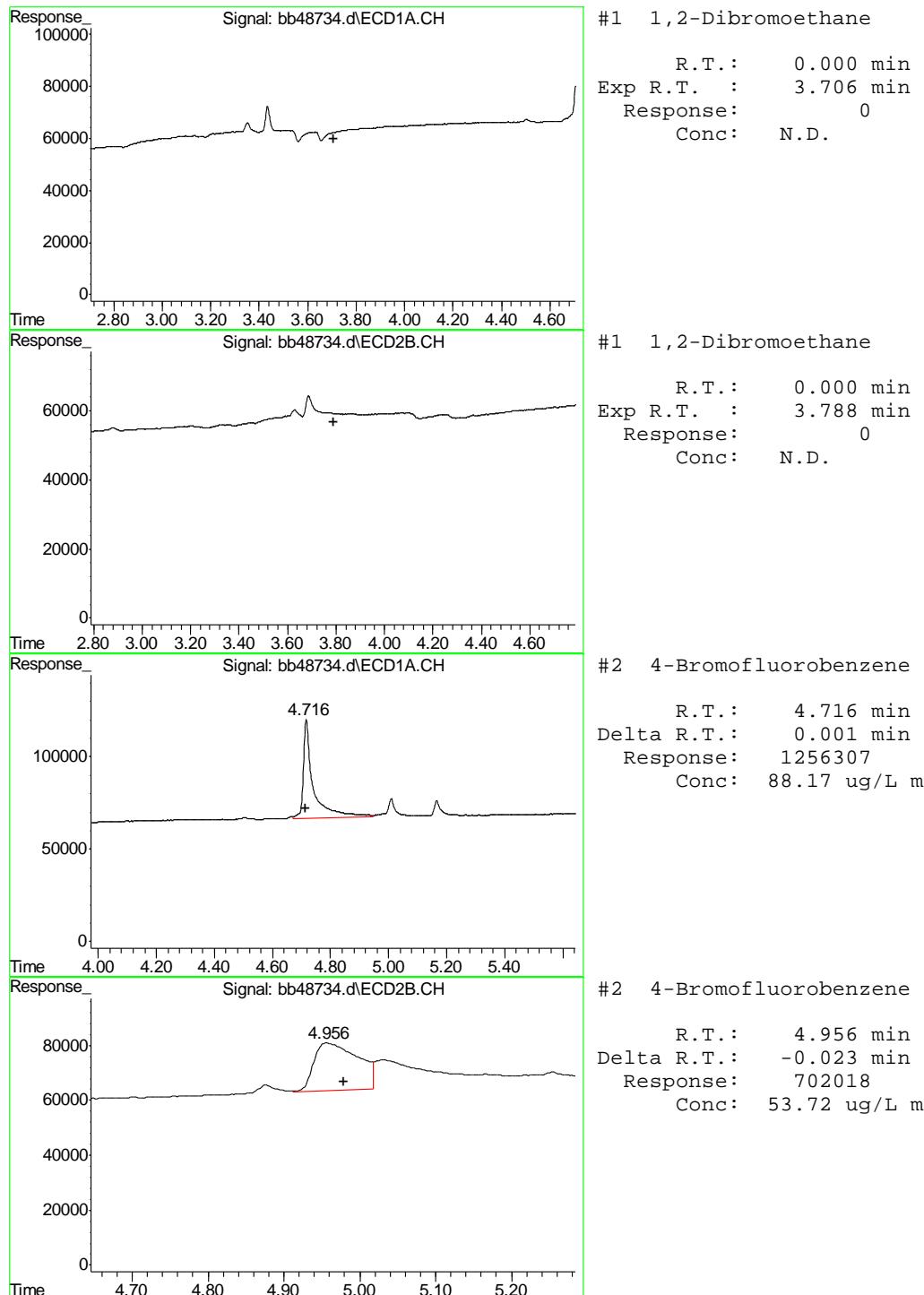
Quantitation Report (QT Reviewed)

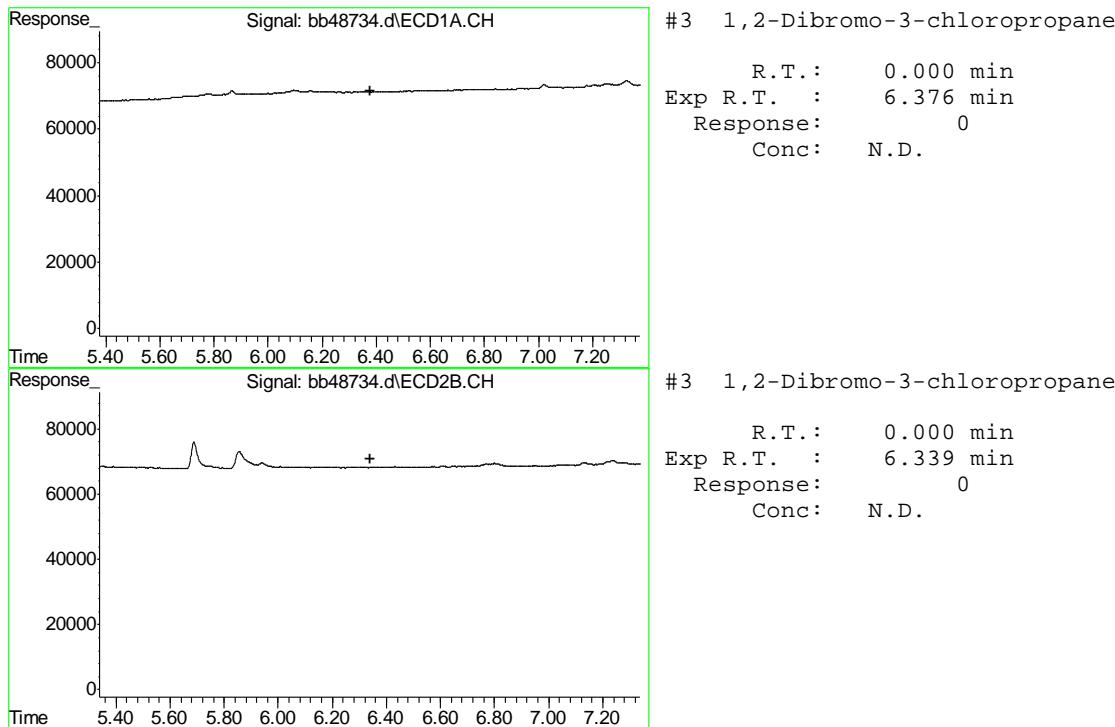
Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48734.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 17:18:59
 Operator : andrip
 Sample : jb39439-3,op33671
 Misc : op33671,gbb2907,30.99,,,50,,,s
 ALS Vial : 7 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:27:25 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







12.1.3

12

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Andri Piluri
 06/20/13 08:28

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48735.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 17:47:06
 Operator : andrip
 Sample : jb39439-4,op33671
 Misc : op33671,gbb2907,30.14,,,50,,s
 ALS Vial : 8 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:27:50 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	4.714	4.929f	1113955	1289817	78.183m	98.691m#
Spiked Amount	50.000	Range	60 - 140	Recovery	=	156.37%# 197.38%#

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d	N.D.	d
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d	N.D.	d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

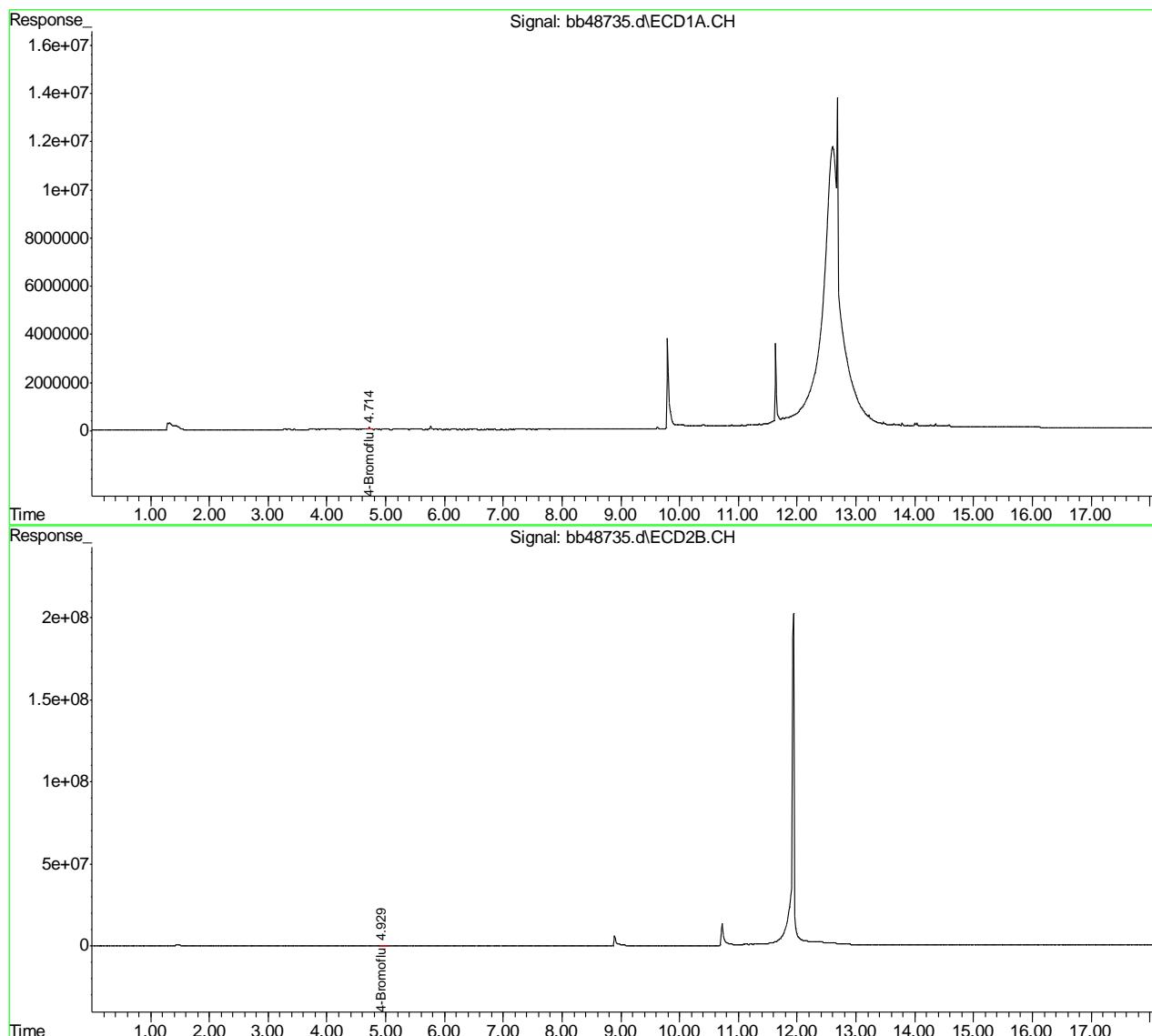
 12.1.4
 12

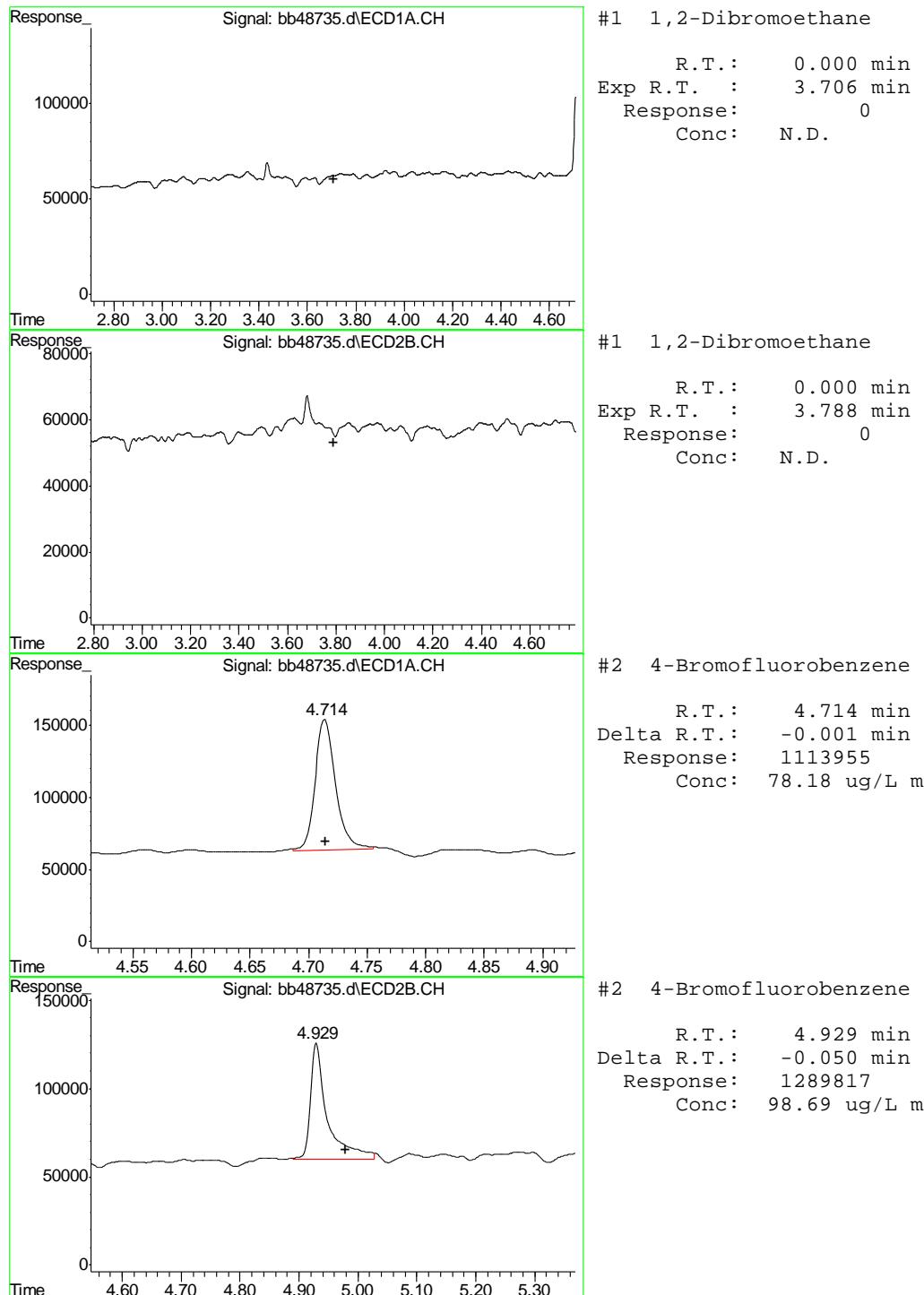
Quantitation Report (QT Reviewed)

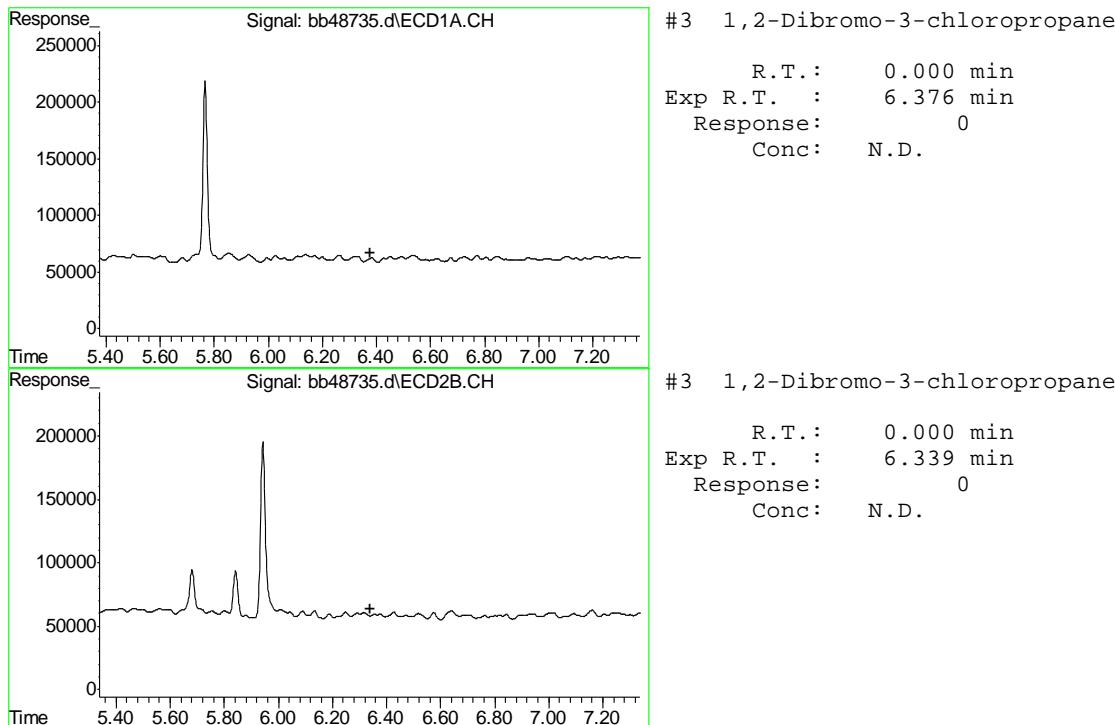
Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48735.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 17:47:06
 Operator : andrip
 Sample : jb39439-4,op33671
 Misc : op33671,gbb2907,30.14,,,50,,,s
 ALS Vial : 8 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:27:50 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







12.1.4

12

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Andri Piluri
 06/20/13 08:28

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48728.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 14:32:09
 Operator : andrip
 Sample : op33671-mb
 Misc : op33671,gbb2907,30.33,,,50,,s
 ALS Vial : 1 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:24:20 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	4.715	4.961f	1136204	676778	79.744m	51.784m#
Spiked Amount	50.000	Range	60 - 140	Recovery	=	159.49%# 103.57%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

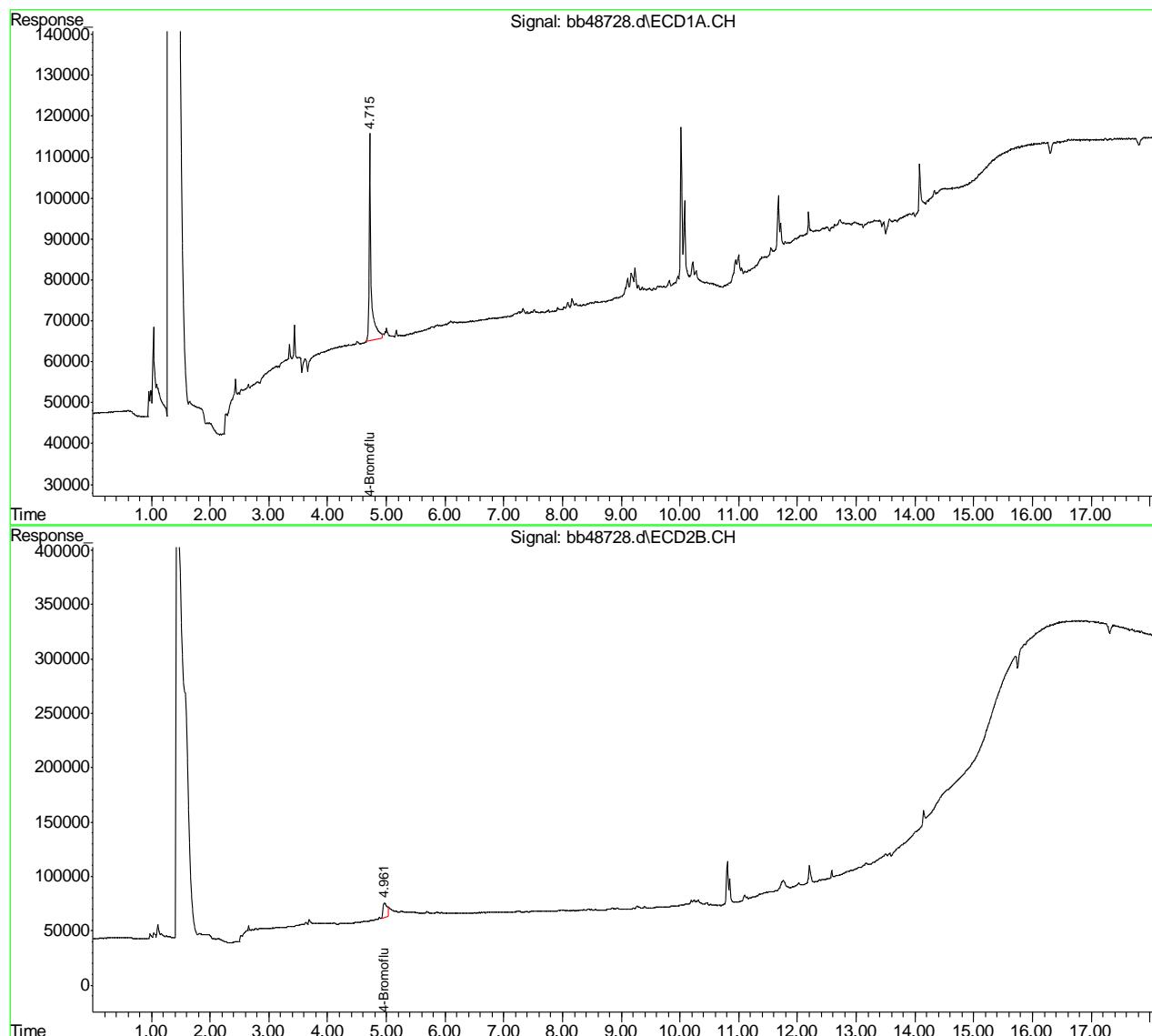
 12.2.1
 12

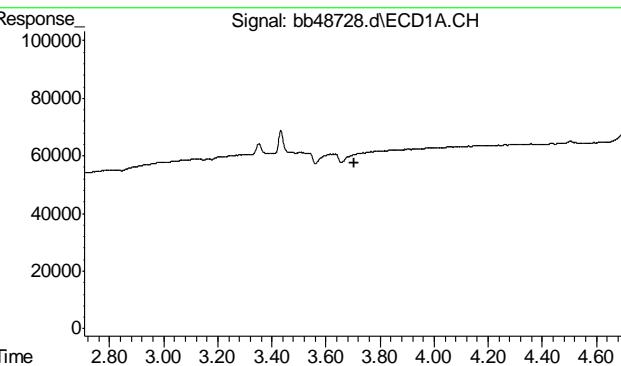
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\Bb130619\
 Data File : bb48728.d
 Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
 Acq On : 19-Jun-13, 14:32:09
 Operator : andrip
 Sample : op33671-mb
 Misc : op33671,gbb2907,30.33,,,50,,s
 ALS Vial : 1 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

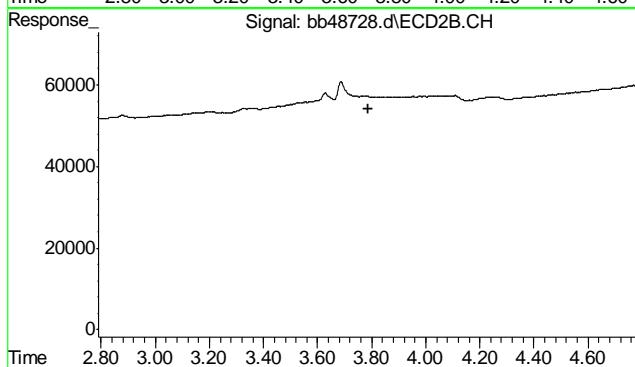
Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: Jun 20 08:24:20 2013
 Quant Method : C:\msdchem\1\METHODS\ES130619.M
 Quant Title : v8011edb soil
 QLast Update : Wed Jun 19 14:10:04 2013
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

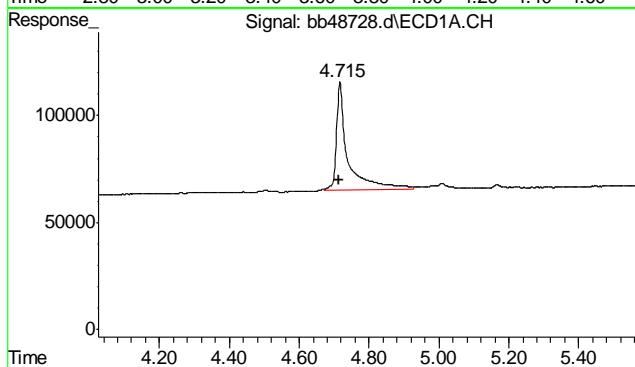




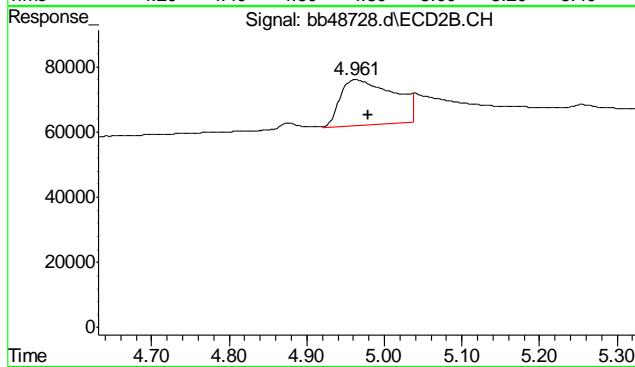
#1 1,2-Dibromoethane
R.T.: 0.000 min
Exp R.T.: 3.706 min
Response: 0
Conc: N.D.



#1 1,2-Dibromoethane
R.T.: 0.000 min
Exp R.T.: 3.788 min
Response: 0
Conc: N.D.



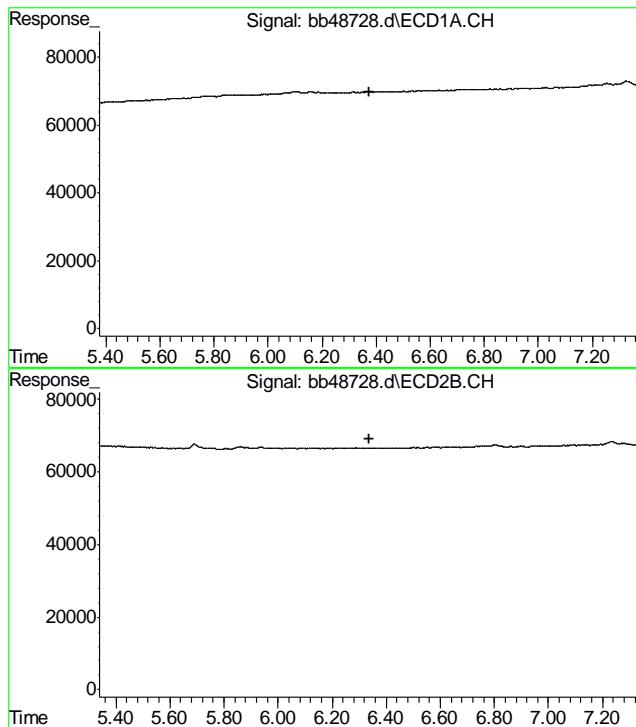
#2 4-Bromofluorobenzene
R.T.: 4.715 min
Delta R.T.: 0.000 min
Response: 1136204
Conc: 79.74 ug/L m



#2 4-Bromofluorobenzene
R.T.: 4.961 min
Delta R.T.: -0.017 min
Response: 676778
Conc: 51.78 ug/L m

12.2.1

12



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T.: 6.376 min
Response: 0
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T.: 6.339 min
Response: 0
Conc: N.D.



Metals Analysis

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

Analyst: EAL

Run ID: MA15757

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:47	MA15757-STD1	1		STD1
16:51	MA15757-STD2	1		STD2
16:55	MA15757-STD3	1		STD3
17:00	MA15757-STD4	1		STD4
17:04	MA15757-ICV1	1		
17:09	MA15757-ICB1	1		
17:14	MA15757-CCV1	1		
17:19	MA15757-CCB1	1		
17:23	MA15757-CRIA1	1		
17:28	MA15757-ICSA1	1		
17:32	MA15757-ICSAB1	1		
17:36	MP21183-B1	1		
17:41	MP21183-MB1	1		
17:45	MP21183-S1	1		TI OVER RANGE; MS OUT FOR SB & MG, NEED PS.
17:50	MP21183-S2	1		TI OVER RANGE.
17:54	MC21539-9	1		(sample used for QC only; not part of login JB39439)
17:58	MP21183-SD1	5		
18:03	MP21183-B2	1		
18:07	MA15757-CCV2	1		
18:11	MA15757-CCB2	1		
18:16	MP21183-LC1	1		
18:20	JB39439-1	1		
18:24	JB39439-2	1		
18:28	JB39439-3	1		
18:33	JB39439-4	1		
-----> Last reportable sample/prep for job JB39439				
18:37	ZZZZZ	1		
18:42	ZZZZZ	1		
18:46	ZZZZZ	1		
18:50	ZZZZZ	1		
18:54	ZZZZZ	1		
18:59	MA15757-CCV3	1		
19:03	MA15757-CCB3	1		
19:07	ZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

Analyst: EAL

Run ID: MA15757

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
19:12	ZZZZZZ	1		
19:16	ZZZZZZ	1		
19:20	ZZZZZZ	1		
19:25	ZZZZZZ	1		
19:29	ZZZZZZ	1		
19:34	ZZZZZZ	1		
19:38	ZZZZZZ	1		
19:42	ZZZZZZ	1		
19:47	ZZZZZZ	1		
19:51	MA15757-CCV4	1		
19:55	MA15757-CCB4	1		
20:00	MP21187-B1	1		
20:04	MP21187-MB1	1		
20:08	MP21187-S1	1		MS OUT FOR SB & CA, NEED PS.
20:13	MP21187-S2	1		
20:17	MC21734-18	1		(sample used for QC only; not part of login JB39439)
20:21	MP21187-SD1	5		
20:26	MP21187-LC1	1		
20:30	ZZZZZZ	1		
20:34	ZZZZZZ	1		
20:39	ZZZZZZ	1		
20:43	MA15757-CCV5	1		
20:47	MA15757-CCB5	1		
20:52	ZZZZZZ	1		
20:56	ZZZZZZ	1		
21:01	ZZZZZZ	1		
21:05	ZZZZZZ	1		
21:09	ZZZZZZ	1		
21:14	ZZZZZZ	1		
21:18	ZZZZZZ	1		
21:23	ZZZZZZ	1		
21:27	ZZZZZZ	1		
21:31	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

Analyst: EAL

Run ID: MA15757

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
21:36	MA15757-CCV6	1		
21:40	MA15757-CCB6	1		
21:44	ZZZZZZ	1		
21:49	ZZZZZZ	1		
21:53	ZZZZZZ	1		
21:57	ZZZZZZ	1		
22:02	ZZZZZZ	1		
22:06	ZZZZZZ	1		
22:11	ZZZZZZ	1		RINSECONF
22:15	MA15757-CRIA2	1		
22:20	MA15757-ICSA2	1		
22:24	MA15757-ICSAB2	1		
22:28	MA15757-CCV7	1		
22:33	MA15757-CCB7	1		

-----> Last reportable CCB for job JB39439
Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

Analyst: EAL

Run ID: MA15757

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
16:47	MA15757-STD1	2447 R	76480 R	12073 R
16:51	MA15757-STD2	2445	76255	12091
16:55	MA15757-STD3			12021
17:00	MA15757-STD4	2481	76229	12164
17:04	MA15757-ICV1	2467	76530	12195
17:09	MA15757-ICB1	2471	77238	12308
17:14	MA15757-CCV1	2468	77214	12255
17:19	MA15757-CCB1	2455	77783	12351
17:23	MA15757-CRIA1	2455	77339	12337
17:28	MA15757-ICSA1	2253	72061	12120
17:32	MA15757-ICSAB1	2255	71762	12130
17:36	MP21183-B1	2453	77570	12361
17:41	MP21183-MB1	2470	77875	12548
17:45	MP21183-S1	2524	79817	13141
17:50	MP21183-S2	2544	80722	13183
17:54	MC21539-9	2593	81695	13329
17:58	MP21183-SD1	2513	79311	12910
18:03	MP21183-B2	2455	78321	12639
18:07	MA15757-CCV2	2479	78223	12556
18:11	MA15757-CCB2	2470	78625	12500
18:16	MP21183-LC1	2660	84212	13797
18:20	JB39439-1	2322	76285	12924
18:24	JB39439-2	2828	90645	14925
18:28	JB39439-3	2578	83458	13900
18:33	JB39439-4	2774	87916	14540
18:37	ZZZZZZ	2834	91170	15432
18:42	ZZZZZZ	2632	83858	14017
18:46	ZZZZZZ	2547	83050	13836
18:50	ZZZZZZ	3086	98503	16464 !a
18:54	ZZZZZZ	2729	88551	14893
18:59	MA15757-CCV3	2445	78956	12954
19:03	MA15757-CCB3	2439	78437	12884
19:07	ZZZZZZ	2572	82421	13636

INTERNAL STANDARD SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

Analyst: EAL

Run ID: MA15757

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
19:12	ZZZZZZ	2597	84462	14060
19:16	ZZZZZZ	2630	84756	13961
19:20	ZZZZZZ	2600	84323	14391
19:25	ZZZZZZ	2618	85012	14426
19:29	ZZZZZZ	2633	86743	14773
19:34	ZZZZZZ	2626	86305	14975
19:38	ZZZZZZ	2706	87932	14964
19:42	ZZZZZZ	2650	85932	15087
19:47	ZZZZZZ	2524	81735	13954
19:51	MA15757-CCV4	2457	78736	13362
19:55	MA15757-CCB4	2453	79366	13184
20:00	MP21187-B1	2425	78802	13103
20:04	MP21187-MB1	2461	80250	13036
20:08	MP21187-S1	2519	81239	13807
20:13	MP21187-S2	2527	81020	13897
20:17	MC21734-18	2685	85466	14749
20:21	MP21187-SD1	2502	80031	13404
20:26	MP21187-LC1	2614	84600	14341
20:30	ZZZZZZ	2541	81395	14003
20:34	ZZZZZZ	2586	83393	14032
20:39	ZZZZZZ	2562	82464	14055
20:43	MA15757-CCV5	2462	78970	13248
20:47	MA15757-CCB5	2454	79148	13182
20:52	ZZZZZZ	2610	83042	14435
20:56	ZZZZZZ	2520	81473	13999
21:01	ZZZZZZ	2567	82191	14265
21:05	ZZZZZZ	2472	80682	14021
21:09	ZZZZZZ	2480	80494	13942
21:14	ZZZZZZ	2462	79787	14138
21:18	ZZZZZZ	2527	82300	14567
21:23	ZZZZZZ	2571	84251	14571
21:27	ZZZZZZ	2528	83504	14512
21:31	ZZZZZZ	2531	83176	14515

INTERNAL STANDARD SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

Analyst: EAL

Run ID: MA15757

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
21:36	MA15757-CCV6	2446	80029	13446
21:40	MA15757-CCB6	2443	80131	13336
21:44	ZZZZZZ	2567	83909	14487
21:49	ZZZZZZ	2560	83791	14364
21:53	ZZZZZZ	2559	83656	14423
21:57	ZZZZZZ	2519	82065	14277
22:02	ZZZZZZ	2584	83799	14077
22:06	ZZZZZZ	2567	83169	14089
22:11	ZZZZZZ	2486	79822	13289
22:15	MA15757-CRIA2	2492	79890	13372
22:20	MA15757-ICSA2	2304	73783	12955
22:24	MA15757-ICSAB2	2303	74447	13005
22:28	MA15757-CCV7	2515	80076	13401
22:33	MA15757-CCB7	2512	80049	13321

R = Reference for ISTD limits. ! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %

(a) No element reported by this internal standard.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP Date Analyzed: 06/17/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15757 Units: ug/l

Metal	Time: Sample ID: RL	IDL	17:09 ICB1		17:19 CCB1		18:11 CCB2		19:03 CCB3		final
			raw	final	raw	final	raw	final	raw	final	
Aluminum	200	12	anr								
Antimony	10	1.1	anr								
Arsenic	10	1.7	anr								
Barium	50	.32	anr								
Beryllium	4.0	.1	anr								
Boron	100	1.1	anr								
Cadmium	4.0	.25	anr								
Calcium	5000	21	anr								
Chromium	10	.48	anr								
Cobalt	50	.29	anr								
Copper	25	.93	anr								
Gold	50	1.5									
Iron	100	3.5	anr								
Lead	10	1.2	0.80	<10	0.40	<10	0.80	<10	1.5	<10	
Magnesium	5000	30	anr								
Manganese	15	.16	anr								
Molybdenum	100	.31									
Nickel	40	.45	anr								
Palladium	50	2.2									
Platinum	50	6.4									
Potassium	5000	54	anr								
Selenium	10	1.7	anr								
Silicon	100	2									
Silver	5.0	.81	anr								
Sodium	5000	16	anr								
Strontium	10	.12									
Thallium	10	1.2	anr								
Tin	100	.87	anr								
Titanium	50	.66	anr								
Tungsten	100	9.3									
Vanadium	10	.82	anr								
Zinc	20	.45	anr								
Zirconium	50	.45									

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP
QC Limits: result < RL

Date Analyzed: 06/17/13
Run ID: MA15757

Methods: SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP Date Analyzed: 06/17/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15757 Units: ug/l

Metal	Sample ID:	Time:		19:55		20:47		21:40		22:33		
		RL	IDL	CCB4	raw	final	CCB5	raw	final	CCB6	raw	final
Aluminum		200	12		anr							
Antimony		10	1.1		anr							
Arsenic		10	1.7		anr							
Barium		50	.32		anr							
Beryllium		4.0	.1		anr							
Boron		100	1.1		anr							
Cadmium		4.0	.25		anr							
Calcium		5000	21		anr							
Chromium		10	.48		anr							
Cobalt		50	.29		anr							
Copper		25	.93		anr							
Gold		50	1.5									
Iron		100	3.5		anr							
Lead		10	1.2		1.0	<10		0.70	<10		0.30	<10
Magnesium		5000	30		anr							
Manganese		15	.16		anr							
Molybdenum		100	.31									
Nickel		40	.45		anr							
Palladium		50	2.2									
Platinum		50	6.4									
Potassium		5000	54		anr							
Selenium		10	1.7		anr							
Silicon		100	2									
Silver		5.0	.81		anr							
Sodium		5000	16		anr							
Strontium		10	.12									
Thallium		10	1.2		anr							
Tin		100	.87		anr							
Titanium		50	.66		anr							
Tungsten		100	9.3									
Vanadium		10	.82		anr							
Zinc		20	.45		anr							
Zirconium		50	.45									

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP
QC Limits: result < RL

Date Analyzed: 06/17/13
Run ID: MA15757

Methods: SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP Date Analyzed: 06/17/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15757 Units: ug/l

Metal	Sample ID:	Time:		17:04		17:14		18:07				
		ICV	ICV1	Results	% Rec	CCV	CCV1	Results	% Rec	CCV	CCV2	
Aluminum		True										
Antimony			anr									
Arsenic			anr									
Barium			anr									
Beryllium			anr									
Boron			anr									
Cadmium			anr									
Calcium			anr									
Chromium			anr									
Cobalt			anr									
Copper			anr									
Gold												
Iron			anr									
Lead		3000	2910	97.0		2000	1940	97.0		2000	1950	97.5
Magnesium			anr									
Manganese			anr									
Molybdenum												
Nickel			anr									
Palladium												
Platinum												
Potassium			anr									
Selenium			anr									
Silicon												
Silver			anr									
Sodium			anr									
Strontium												
Thallium			anr									
Tin			anr									
Titanium			anr									
Tungsten												
Vanadium			anr									
Zinc			anr									
Zirconium												

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 06/17/13

Run ID: MA15757

Methods: SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.1.3
13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP Date Analyzed: 06/17/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15757 Units: ug/l

Metal	Time: Sample ID: Metal	True	18:59 CCV Results	% Rec	CCV True	19:51 CCV4 Results	% Rec	CCV True	20:43 CCV5 Results	% Rec
Aluminum		anr								
Antimony		anr								
Arsenic		anr								
Barium		anr								
Beryllium		anr								
Boron		anr								
Cadmium		anr								
Calcium		anr								
Chromium		anr								
Cobalt		anr								
Copper		anr								
Gold										
Iron		anr								
Lead	2000	1960	98.0		2000	1960	98.0	2000	1950	97.5
Magnesium		anr								
Manganese		anr								
Molybdenum										
Nickel		anr								
Palladium										
Platinum										
Potassium		anr								
Selenium		anr								
Silicon										
Silver		anr								
Sodium		anr								
Strontium										
Thallium		anr								
Tin		anr								
Titanium		anr								
Tungsten										
Vanadium		anr								
Zinc		anr								
Zirconium										

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 06/17/13

Run ID: MA15757

Methods: SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.1.3
13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP Date Analyzed: 06/17/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15757 Units: ug/l

Metal	Time: Sample ID: True	21:36 CCV Results		22:28 CCV Results		% Rec
		CCV6	% Rec	CCV7	% Rec	
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Boron	anr					
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Gold						
Iron	anr					
Lead	2000	1950	97.5	2000	1910	95.5
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Palladium						
Platinum						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Thallium	anr					
Tin	anr					
Titanium	anr					
Tungsten						
Vanadium	anr					
Zinc	anr					
Zirconium						

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 06/17/13

Run ID: MA15757

Methods: SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.1.3
13

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

QC Limits: CRI 70-130% CRIA 70-130%

Run ID: MA15757

Units: ug/l

Metal	Time:		17:23		22:15		
	Sample ID:	CRI	CRIA	CRIA1	Results	% Rec	
Aluminum	True	True					
Antimony	6.0	10					
Arsenic	4.0	10					
Barium	50	50					
Beryllium	4.0	4.0					
Boron	100	100					
Cadmium	4.0	4.0					
Calcium	5000	5000					
Chromium	10	10					
Cobalt	50	50					
Copper	25	25					
Gold	50	50					
Iron	100	100					
Lead	5.0	10	10.5	105.0	10.5	105.0	
Magnesium	5000	5000					
Manganese	15	15					
Molybdenum	100	100					
Nickel	40	40					
Palladium	50	50					
Platinum	50	50					
Potassium	5000	5000					
Selenium	10	10					
Silicon	100	100					
Silver	5.0	5.0					
Sodium	5000	5000					
Strontium	10	10					
Thallium	5.0	10					
Tin	100	100					
Titanium	50	50					
Tungsten	100	100					
Vanadium	10	10					
Zinc	20	20					
Zirconium	50	50					

(*) Outside of QC limits

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

QC Limits: CRI 70-130% CRIA 70-130%

Run ID: MA15757

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB39439
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP Date Analyzed: 06/17/13 Methods: SW846 6010C
 QC Limits: 80 to 120 % Recovery Run ID: MA15757 Units: ug/l

Metal	Time:		17:28		17:32		22:20		22:24	
	Sample ID:	ICSA	ICSA	ICSA1 Results	% Rec	ICSA1 Results	% Rec	ICSA2 Results	% Rec	ICSA2 Results
Aluminum	500000	500000	502000	100.4	505000	101.0	502000	100.4	505000	101.0
Antimony	2000	0.10			2050	102.5	0.10		2070	103.5
Arsenic	2000	-5.1			2020	101.0	-0.90		2020	101.0
Barium	500	-0.90			502	100.4	-1.0		491	98.2
Beryllium	500	0.20			459	91.8	0.20		449	89.8
Boron	1000	2.9			1020	102.0	1.6		1040	104.0
Cadmium	1000	0.60			1020	102.0	0.40		1010	101.0
Calcium	500000	500000	450000	90.0	446000	89.2	438000	87.6	436000	87.2
Chromium	500	0.30			475	95.0	0.10		465	93.0
Cobalt	500	1.7			478	95.6	1.4		474	94.8
Copper	500	0.80			508	101.6	1.0		516	103.2
Gold	500	-3.1			475	95.0	-3.2		461	92.2
Iron	200000	200000	177000	88.5	177000	88.5	171000	85.5	172000	86.0
Lead	1000	0.0			901	90.1	0.40		888	88.8
Magnesium	500000	500000	499000	99.8	498000	99.6	482000	96.4	484000	96.8
Manganese	500	1.2			483	96.6	1.6		482	96.4
Molybdenum	1000	-0.20			930	93.0	-0.40		940	94.0
Nickel	1000	-1.4			893	89.3	-1.9		890	89.0
Palladium	500	-33			488	97.6	-40		500	100.0
Platinum	500	-15			472	94.4	-19		482	96.4
Potassium		100			73.4		155		173	
Selenium	2000	-0.50			2010	100.5	-3.2		2020	101.0
Silicon	2000	40.5			2160	108.0	44.4		2180	109.0
Silver	1000	-0.50			1030	103.0	-0.40		1020	102.0
Sodium		93.2			78.5		80.6		72.4	
Strontium	1000	1.0			961	96.1	1.1		953	95.3
Thallium	2000	1.4			1850	92.5	-0.30		1830	91.5
Tin	1000	1.4			945	94.5	1.1		930	93.0
Titanium	500	8.6			500	100.0	8.6		495	99.0
Tungsten	2000	-34			1590	79.5*	-38		1610	80.5
Vanadium	500	0.20			484	96.8	-0.10		476	95.2
Zinc	1000	-0.80			900	90.0	-0.60		874	87.4
Zirconium	500	0.30			459	91.8	0.30		454	90.8

(*) Outside of QC limits

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB061713M2.ICP

Date Analyzed: 06/17/13

Methods: SW846 6010C

QC Limits: 80 to 120 % Recovery

Run ID: MA15757

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

06/14/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	1.2	3.6		
Antimony	1.0	.11	.15		
Arsenic	1.0	.17	.21		
Barium	5.0	.032	.073		
Beryllium	0.40	.01	.024		
Boron	10	.11	.11		
Cadmium	0.40	.025	.042		
Calcium	500	2.1	6.3		
Chromium	1.0	.048	.095		
Cobalt	5.0	.029	.047		
Copper	2.5	.093	.56		
Gold	5.0	.15	.43		
Iron	10	.35	.87		
Lead	1.0	.12	.17	0.13	<1.0
Magnesium	500	3	5.1		
Manganese	1.5	.016	.04		
Molybdenum	10	.031	.07		
Nickel	4.0	.045	.044		
Palladium	5.0	.22	.64		
Platinum	5.0	.64	1.5		
Potassium	500	5.4	8.6		
Selenium	1.0	.17	.35		
Silicon	10	.2	3.3		
Silver	0.50	.081	.13		
Sodium	500	1.6	3.3		
Strontium	1.0	.012	.03		
Thallium	1.0	.12	.13		
Tin	10	.087	.14		
Titanium	5.0	.066	.14		
Tungsten	10	.93	.94		
Vanadium	1.0	.082	.13		
Zinc	2.0	.045	.16		
Zirconium	5.0	.045	.088		

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB39439
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLIDMethods: SW846 6010C
Units: mg/kg

Prep Date: 06/14/13

Metal	MC21539-9 Original MS	Spikelot MPICP	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Gold				
Iron	anr			
Lead	4.7	92.0	100	87.0 75-125
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium	anr			
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

13.2.2

13

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

13.2.2
13

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB39439
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 06/14/13

Metal	MC21539-9 Original MSD	Spikelot MPICP	MSD % Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Boron	anr				
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Gold					
Iron	anr				
Lead	4.7	92.2	100	87.2	0.2
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Palladium					
Platinum					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Thallium	anr				
Tin					
Titanium	anr				
Tungsten					
Vanadium	anr				
Zinc	anr				
Zirconium					

13.2.2

13

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

13.2.2

13

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLIDMethods: SW846 6010C
Units: mg/kg

Prep Date:

06/14/13

06/14/13

Metal	BSP Result	Spikelot MPICP	QC % Rec	BSD Limits	Spikelot Result	BSD MPICP	QC % Rec	BSD RPD	QC Limit
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Boron	anr								
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Gold									
Iron	anr								
Lead	94.3	100	94.3	80-120	93.8	100	93.8	0.5	20
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Palladium									
Platinum									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium	anr								
Tungsten									
Vanadium	anr								
Zinc	anr								
Zirconium									

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

13.2.3

13

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39439
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 06/14/13

Metal	LCS Result	Spikelot MPLCS80	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Gold				
Iron	anr			
Lead	109	115	94.8	82-119
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium	anr			
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

13.2.3

13

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

13.2.3

13

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLIDMethods: SW846 6010C
Units: ug/l

Prep Date: 06/14/13

Metal	MC21539-9 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Gold				
Iron	anr			
Lead	47.2	49.1	4.0	0-10
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium	anr			
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

13.2.4
13

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

POST DIGESTATE SPIKE SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLIDMethods: SW846 6010C
Units: ug/l

Prep Date:

06/14/13

Metal	Sample ml	Final ml	MC21539-9 Raw	PS Corr.**	Spike ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
-------	--------------	-------------	------------------	---------------	---------------	-------------	----------------	---------------	-------	--------------

Aluminum

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Calcium

Chromium

Cobalt

Copper

Gold

Iron

Lead

Magnesium

Manganese

Molybdenum

Nickel

Palladium

Platinum

Potassium

Selenium

Silicon

Silver

Sodium

Strontium

Thallium

Tin

Titanium

Tungsten

Vanadium

Zinc

Zirconium

POST DIGESTATE SPIKE SUMMARY

Login Number: JB39439

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21183
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

Associated samples MP21183: JB39439-1, JB39439-2, JB39439-3, JB39439-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(**) Corr. sample result = Raw * (sample volume / final volume)

(anr) Analyte not requested

13.2.5

13



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Page 1 of 1

Job Number: JB39439

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: JB39439-1 **Analyzed:** 17-JUN-13 by HS **Method:** SM21 2540 B MOD.
ClientID: AOI-5_MW-464_0-2'_61213

Wet Weight (Total)	47.267	g
Tare Weight	27.487	g
Dry Weight (Total)	45.288	g
Solids, Percent	90	%

Sample: JB39439-2 **Analyzed:** 17-JUN-13 by HS **Method:** SM21 2540 B MOD.
ClientID: AOI-5_MW-464_2-4'_61213

Wet Weight (Total)	36.839	g
Tare Weight	26.929	g
Dry Weight (Total)	34.949	g
Solids, Percent	80.9	%

Sample: JB39439-3 **Analyzed:** 17-JUN-13 by HS **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-467_0-1_061213

Wet Weight (Total)	33.592	g
Tare Weight	23.923	g
Dry Weight (Total)	32.359	g
Solids, Percent	87.2	%

Sample: JB39439-4 **Analyzed:** 17-JUN-13 by HS **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-467_9-10_061213

Wet Weight (Total)	41.641	g
Tare Weight	26.922	g
Dry Weight (Total)	38.145	g
Solids, Percent	76.2	%



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Page 1 of 1

Job Number: JB39439

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: JB39439-1 **Analyzed:** 17-JUN-13 by AMA **Method:** SM21 2540 B MOD.
ClientID: AOI-5_MW-464_0-2'_61213

Wet Weight (Total)	47.267	g
Tare Weight	27.487	g
Dry Weight (Total)	45.288	g
Solids, Percent	90	%

Sample: JB39439-2 **Analyzed:** 17-JUN-13 by AMA **Method:** SM21 2540 B MOD.
ClientID: AOI-5_MW-464_2-4'_61213

Wet Weight (Total)	36.839	g
Tare Weight	26.929	g
Dry Weight (Total)	34.949	g
Solids, Percent	80.9	%

Sample: JB39439-3 **Analyzed:** 17-JUN-13 by AMA **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-467_0-1_061213

Wet Weight (Total)	33.592	g
Tare Weight	23.923	g
Dry Weight (Total)	32.359	g
Solids, Percent	87.2	%

Sample: JB39439-4 **Analyzed:** 17-JUN-13 by AMA **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-467_9-10_061213

Wet Weight (Total)	41.641	g
Tare Weight	26.922	g
Dry Weight (Total)	38.145	g
Solids, Percent	76.2	%
